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UNIVERSITY OF ALBERTA

AN EVALUATION OF AVERSIVE AND NONAVERSIVE INTERVENTIONS USED IN THE TREATMENT OF DEVELOPMENTALLY DISABLED PERSONS

BY

KELLY MACGREGOR

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATION

IN

SPECIAL EDUCATION

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EDMONTON, ALBERTA

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Kelly MacGregor
(Student's signature)

[illegible]
(Student's permanent address)

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Dick Sobsey

Linda McDonald

Frank Epling

Date: December 3, 1992

DEDICATION

This thesis is dedicated to the memory of Stuart MacGregor.

ABSTRACT

A critical review of the research literature on aversive and nonaversive treatments for the problem behaviors of developmentally disabled clients was conducted, in order to evaluate and compare the two types of research. Criteria that have been proposed for the appropriate use of intrusive interventions were identified on the basis of a review of the literature. These criteria were then operationalized, and studies published between the years of 1985 and 1989 were assessed with respect to the extent to which they satisfied these standards. In addition, severity of behavior and level of intrusiveness of treatment were compared. Demographic data (for example, data regarding subject age, diagnosis, residential status, and treatment setting) were also collected. The effectiveness of both types of studies was assessed as well, by estimating the percentage of change from baseline to treatment phases in each study. Reliability was assessed using a test–retest procedure, which indicated that the reliability was acceptable for all but one of the criteria ("purpose of study"), and for the demographic and effectiveness ratings. Findings show that the majority of both types of studies failed to satisfy the operationalized criteria. In particular, the studies lacked information regarding the criteria of documentation of informed consent and capacity to consent, maintenance of effects, and social validation. Aversive and nonaversive procedures were roughly equivalent in terms of percentage of change produced in target behaviors, and findings suggest that both aversive and nonaversive treatments were less effective for more severe behaviors. Findings also show that the

majority of more intrusive treatments were used with behaviors of lesser severity (contrary to the least intrusion principle), and that the majority of nonaversive treatments targeted behaviors of lesser severity as well. The results show that a greater percentage of subjects were children, and that a greater percentage of subjects had been labelled severely or profoundly mentally retarded. Greater emphasis on documentation of due process procedures and informed consent, increased consideration of social and empirical validity of treatments and treatment outcomes, as well as greater methodological rigor in the research, are recommended.

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CHAPTER 1

Behavior analysis has contributed greatly to the treatment of individuals with developmental disabilities. Aversive techniques in particular have been shown to ameliorate or eliminate some of the severely maladaptive and self-injurious behaviors exhibited by these clients, and are in fact the traditional approach to problematic behavior. A wide variety of punishment procedures have been applied, including verbal reprimand, physical restraint, electric shock, and aversive physical consequences (Matson, 1985). However, ethical and legal issues involved in the use of punishment procedures, as well as the expanding literature on nonaversive alternatives (e.g., Bird, Dores, Moniz, & Robinson, 1989; Carr & Durand, 1985; Donnellan & LaVigna, 1986; Evans & Meyer, 1985), have led some researchers in special education to question the necessity for and efficacy of aversive treatment.

Opposition to the use of punishment procedures is not a new phenomenon, and much of the punishment literature itself has included some form of caveat regarding the application of punishment to human behavior (Risley, 1968). In one of the earliest comprehensive texts on behaviorism, Skinner (1953, pp. 182-183) suggested that although punishment is a prevalent means of behavioral control in our society, it has undesirable side effects. Researchers have also been concerned with the question of the relative efficacy of punishment and less intrusive therapies since the early days of the development of behavior analysis. Lovaas and Simmons (1969), for example,

examined the effectiveness of extinction and punishment in the suppression of self-injurious behavior. They concluded that punishment was the more effective of the two techniques, because it suppressed the behavior immediately, whereas extinction produced a change only after thousands of self-injurious responses. These authors also expressed concern regarding the extent to which punishment resulted in long-term change in behavior. Questions such as these are not new to the field, but continue to contribute to the controversy regarding aversive procedures.

Central to the present debate is the question of whether the use of more intrusive treatments is justifiable, considering the nature of the problem behaviors in question, the degrees of intrusiveness or restrictiveness of particular techniques, and the anticipated effects of these techniques. There is also some question as to whether nonaversive treatments are actually viable alternatives to punishment procedures, in cases of severely maladaptive or life-threatening behavior. This study of the published research on aversive and nonaversive techniques used in the treatment of maladaptive behavior, was conducted in order to evaluate and compare both types of studies, and included an assessment of: (1) the extent to which both types of studies conformed to guidelines that have been proposed for the appropriate use of intrusive therapies; (2) demographic information such as subject age and diagnosis; (3) the types of treatments used and the behaviors involved; and (4) the effectiveness of particular approaches.

This introductory chapter will review various arguments for and against the use of aversives. These arguments encompass moral and ethical objections to the use of punishment, legal considerations, problems associated with the use of punishment, the right to treatment position, the least intrusive treatment principle, and the question of treatment efficacy. The results of recent literature reviews, as they pertain to these issues, are also discussed in the following section.

The Question of Treatment Efficacy

A major concern in arguments for or against the use of aversives is that of treatment efficacy. Researchers who advocate the use of aversives, assert that there is a lack of unequivocal data regarding the effectiveness of less intrusive therapies (Matson & Taras, 1989). Therefore, in cases of life-threatening or severely maladaptive behavior, according to these individuals, it is better to implement more restrictive treatments whose effectiveness in similar cases has been documented, rather than to implement procedures that may not be successful (Daniels, 1986). Advocates of the right to treatment approach (e.g., Van Houten, Axelrod, Bailey, Favell, Foxx, Iwata & Lovaas, 1988) argue that highly intrusive intervention strategies have been shown to be the most effective treatments with severe problem behavior, and that clients actually have a right to receive these types of therapies.

There is also an extensive body of research on animal and human subjects, in which aversives have been shown to be effective and efficient means of reducing a wide range of behaviors. They are therefore seen as cost-efficient, expedient procedures, and their intrusiveness is justified by the potential benefit that has been documented in the research literature (Daniels, 1986). In addition, in cases of severely self-injurious or maladaptive behavior, aversive interventions may present less risk than the behaviors themselves (Lovaas & Favell, 1987).

The results of the research literature are not unequivocal, however, and a number of reviewers have pointed out that the decelerative literature has serious methodological shortcomings (Guess, Helmstetter, Turnbull & Knowlton, 1987; Lundervold & Bourland, 1988; Starin & Fuqua, 1987). These include design problems such as failure to consider the influences of regression and phase-sequence or carry-over effects (i.e., the influence of treatments applied in subsequent phases) in the data (Sobsey, in press), and limited follow-up or generalization data (Lovaas & Favell, 1987; Lennox, Miltenberger, Spengler, & Erfanian, 1988). There also appears to have been a publication bias in favor of aversive treatments which are successful (LaVigna & Donnellan, 1986). This makes adequate evaluation of the research literature difficult, thereby complicating the debate.

In addition, it has been suggested that aversive procedures do not result in long-term change in the target behavior (Meyer & Evans, 1989), and to be effective a treatment must produce lasting behavioral change. This element of

"effectiveness," however, is also difficult to assess, because there is inadequate documentation of long-term treatment gains in the treatment literature. For example, reviews by Lennox and others (1988), Guess and others (1987), and Matson and Taras (1989), have shown that less than 50% of the studies in these respective samples reported generalization of effects, follow-up data, or long- term treatment effects. Without information regarding duration of behavioral improvement in the literature, it is difficult to gauge whether aversives work only in the short-term or have longer effects.

Other Criteria for Effectiveness

In contrast to the focus of traditional approaches, proponents of the use of positive procedures define treatment effectiveness in terms of the context in which lasting behavior change occurs. That is, an effective treatment is one which results in long-term behavior change which is maintained in a variety of normalized and integrated community settings (Meyer & Evans, 1989). Any intervention strategy must also be normalized, according to these researchers, and treatment goals should emphasize instruction and participation in meaningful daily experiences.

Functional Analysis of Behavior to Ensure Long-Term Change

In response to concerns regarding long-term change, certain researchers also advocate prior functional and structural analyses of behavior, in order to ensure that sustained improvement results. Viewed within the context of functional analysis, problem behaviors are also seen to serve an adaptive function for the individual (Meyer & Evans, 1989). That is, certain excess behaviors such as stereotypy or noncompliance, for example, may serve a communicative function in some cases, and teaching clients more socially acceptable means of communicating has been shown to decrease inappropriate behavior (e.g., Durand & Carr, 1987; Horner & Budd, 1985). Research has also shown that teaching more appropriate behaviors which serve the same purpose for the client, can result in a decrease in the problem behavior (e.g., Donnellan, Mirenda, Mesaros, & Fassbender, 1984).

The more lasting improvements noted when the simple stimulus-response conceptualization of behavior is expanded in this way, have led to greater consideration of the effects ecological as well as internal factors may have on behavior. For example, it has been noted that behavior problems may mask an underlying problem. Problem behaviors have been documented to occur in response to sexual abuse (Sobsey, in press) and as a result of physical disorders such as urinary tract infections or toxic anticonvulsant levels (Gunsett, Mulick, Fernald, & Martin, 1989). The interaction of psychotropic medications and behavioral interventions is also being considered, and concurrent drug

treatment is increasingly acknowledged to be an important subject characteristic in the treatment literature (Delaney & Poling, in press).

Problems Associated with the Use of Punishment

Researchers opposed to the use of aversives, point to the dangers of misapplication, overuse, or abuse of punishment procedures (Guess et al., 1987; Sobsey, in press). This has alternately been termed the "spread effect,"the "slippery slope phenomenon,"the problem of "procedural decay," and the "punishment trap" (Daniels, 1986; Guess et al., 1987; Sobsey, in press). That is, according to Daniels (1986, p. 59), "punishing agents may escalate their use of punishment due to the powerful and positive side effects associated with its use." For example, in response to the successful application of punishment in one instance, punishing agents may also apply aversives in other situations in which the use of this type of procedure is not appropriate. The additional problems of inconsistent treatment or poor treatment integrity, due to the difficulty inherent in the application of aversive procedures outside of laboratory settings, have also led researchers to question whether the potential for abuse of these procedures is actually greater than any future benefit that may result (Sobsey, in press). There is also the question of whether the mental health or rehabilitation system has the right to regulate itself, or if it must be regulated or "counter-controlled" in some way by the state or society as a whole, in order to prevent abuse (Guess et al., 1987; Sobsey, in press).

Advocates of positive interventions have noted, in addition, that punishment has a number of undesirable side effects on the recipient of the aversive stimulation. Those documented in the research literature include escape-avoidance behavior, punishment- induced aggression, and negative emotional reactions (Azrin & Holz, 1966; Skinner, 1953). There is also some evidence from social psychology that punishment procedures have undesirable effects on those administering the treatment (e.g., Milgram, 1963), and the use of aversives may lead to depersonalization of the subject and dehumanization of the therapist (Turnbull, Guess, Backus, Barber, Fiedler, Helmstetter, & Summers, 1986). Again, it becomes a question of whether the use of aversives is justifiable, considering their effects and side-effects.

Moral and Ethical Issues Related to the Use of Punishment

Opponents of the use of punishment procedures have objected to these techniques because they are seen to be inhumane and cruel. Reference has been made to traditional Judaic and Christian opposition to cruelty, in support of the position that punishment is morally wrong (Turnbull, Guess, Backus, Barber, Fiedler, Helmstetter, & Summers, 1986). Those advocating the use of alternative treatments have also alternately characterized aversive procedures as forms of physical abuse and torture. Guess and colleagues (1987), for example, compare certain punishment procedures to an Amnesty International list of some of the torture techniques used with political prisoners, and the

techniques as presented in this context appear to be remarkably similar. Sobsey (in press) notes that food deprivation and electroconvulsive shock treatments were used with Vietnamese mental patients in the 1960's, as forms of "therapy."

Issues of power and control are also involved in this debate. Although the present controversy has contributed to a greater awareness of the human and civil rights of disabled clients, these persons continue to be denied rights or protection granted to other populations[a](Guess et al., 1987; Sobsey, in press). In addition, there is some question as to whether persons who are more limited due to the nature and extent of their disability, and who therefore lack advocacy skills, are more vulnerable to control (Guess et al., 1987). The results of literature reviews (e.g., Guess et al., 1987; Lundervold & Bourland, 1988; Matson & Taras, 1989) have shown that punishment procedures have been used to a greater extent with institutionalized persons labelled profoundly or severely retarded, although Lundervold and Bourland (1988) found that the concurrent use of positive reinforcement strategies was also higher for this group. Reviews have shown, as well, that aversive procedures have been used more frequently with children, as compared to other age groups (Guess et al., 1987; Matson & Gorman-Smith, 1986; Matson & Taras, 1989).

Certain researchers also reject what they term the readiness or eliminative approach to behavior problems (Meyer & Evans, 1989), the idea that inappropriate or interfering behaviors must be eliminated before clients can participate in meaningful programming or community lifestyles. They note that

their approach is based on values, and incorporates the principles of normalization and community participation (Meyer & Evans, 1989). Here the social validity and acceptability of nonaversive or positive treatment procedures is emphasized. The use of punishment, in contrast, is said to contribute to the therapist's and society's perceptions of mentally disabled persons as deviant and less than human (Guess et al., 1987). It is also believed that the use of aversives encourages segregation and contributes to negative perceptions of the handicapped, which is counter-productive if the overall goals of the rehabilitation field are normalization and integration (Meyer & Evans, 1989).

Punishment as Normative

Other writers have argued that punishment is, to some extent, normative in our society (Mulick & Kedesdy, 1988). That is, certain inherent restrictions and forms of aversive control influence everyone in some way. It might be said, then, that to a limited degree certain forms of punishment have "social validity" and might be judged as socially acceptable, but the types of aversive procedures used with disabled clients have typically been much more restrictive than those typically used with nondisabled persons. There has been a considerable amount of research on the social acceptability of aversive techniques (e.g., Meunier, Higgins, & Kissell, 1983; Morgan, 1989), and public perceptions of these techniques have increasingly been recognized as an important

consideration in treatment selection. The question of "treatment" is not only an ethical issue. It has become a political and legal issue, as well.

The Least Restrictive Alternative Doctrine and the Right to Treatment Position

The least restriction doctrine is a legal and clinical concept that has been used in arguments for and against the use of aversives. As a legal concept, it holds that when the State must intervene in the lives of its citizens, it must do so in the least intrusive or limiting manner possible (Sobsey, in press). A number of researchers in favor of aversives have based their arguments on what can be termed a clinical interpretation of least restriction, that is, the premise that a therapist has an obligation to provide, and a client has the right to receive, the least intrusive yet effective treatment available (e.g., Van Houten et al., 1988). This is known as the right to treatment position. In their interpretation of the clinical aspects of the least restriction doctrine, advocates of this position emphasize the presumed effectiveness of punishment. That is, punishment is believed to be the least intrusive yet most effective technology available, in situations where the behavior in question is either severely maladaptive or life-threatening and has not improved in response to less intrusive treatments (Van Houten et al., 1988).

Alternate Views of Least Intrusion

Advocates of the use of nonaversive treatments, in contrast to adherents of the right to treatment position, reject the notion that more severe behavior problems must be treated with highly intrusive interventions. This notion has been termed the "myth of intrusiveness," and may reflect the misinterpretation of the least restrictive alternative doctrine on the part of practitioners, that less intrusive procedures will not work with more severe behaviors (Sobsey, in press). In contrast, supporters of the use of nonaversive treatments see less intrusive or restrictive procedures as viable, more acceptable alternatives to punishment. From this perspective the principle of least intrusion is taken at face value.

Conclusion and Rationale for the Present Study

The controversy regarding the use of aversive and alternative procedures stems in part from problems associated with the use of punishment, and in part from the question of relative efficacy. Ethical, legal, and civil rights issues are also involved. The debate is complicated by the difficulty in evaluating the effectiveness of decelerative research, due to its methodological shortcomings, in particular design problems and a lack of follow-up data. In addition, the debate is related to certain values or ethical views which are relatively subjective and also difficult to evaluate. It is evident, however, that the different

arguments reflect very real concerns with respect to current approaches to problem behavior.

In response to these concerns, certain guidelines have been proposed. These include criteria for the application of specific procedures such as contingent electric shock and guidelines for obtaining informed consent (Foxx, Plaska, & Bittle, 1986), as well as position statements regarding the use of aversive treatment in general (American Association on Mental Deficiency, 1987; Favell, Azrin, Baumeister, Carr, Dorsey, Forehand, Foxx, Lovaas, Rincover, Risley, Romanczyk, Russo, Schroeder, & Solnick, 1982; Guess et al., 1987; Skinner, as cited in in Griffen, Paisey, Stark, & Emerson, 1988; Sobsey, in press; TASH Resolution, 1987; Van Houten et al., 1988). The literature on aversive applications and decelerative programs has also been reviewed or evaluated elsewhere (e.g., Lennox et al., 1988; Lundervold & Bourland, 1988; Matson, 1985; Matson & Gorman-Smith, 1986; Matson & Taras, 1989; Mulick & Kedesdy, 1988). However, until now, an attempt has not been made to compare the characteristics of decelerative research, with some of the guidelines or criteria that have been established. These include, for example, the requirements of least intrusive treatment alternative, informed consent, and clear benefit to the client. The present study was undertaken in order to determine the extent to which both aversive and nonaversive behavior management studies satisfy criteria such as these. That is, when some of the established guidelines are operationalized, to what extent do recent decelerative studies conform to these standards? Studies utilizing nonaversive

techniques were included in the evaluation, in order to provide information regarding their adequacy with respect to the guidelines that have been proposed.

Research studies were also assessed with respect to the overall effectiveness of particular treatments, as measured by percent of change from baseline to treatment phases. The demographic characteristics of subjects, target behaviors, treatments, and settings in which treatments were conducted were also examined, and comparisons between levels of intrusiveness of interventions and severity of behaviors were made as well.

Summary

Chapter 2 in this study presents some of the definitions of punishment, aversive procedures, and nonaversive techniques. Criteria that have been proposed for the appropriateness of aversives and the ethical and legal bases of these guidelines are then reviewed in Chapter 3. The operationalized criteria derived from these guidelines are presented in Chapter 4, as well as the method and procedures of the study. The results are presented in Chapter 5, and these results are discussed in Chapter 6 of this thesis.

CHAPTER 2. DEFINITION OF TERMS

The debate regarding aversive treatment has been complicated by a lack of consensus regarding what constitutes aversive and nonaversive procedures. The following review will examine some of the definitions of these procedures presented in the literature, in order to delimit the investigation.

Aversives and Punishment

Definitions of aversive procedures vary, and a distinction is not usually made between punishment and aversive procedures. The term "punishment" as used in the behavioral literature, is typically functionally defined as a consequence of behavior that reduces the future probability, or rate of occurrence, of that behavior (Azrin & Holz, 1966; Sulzer-Azaroff & Mayer, 1977). "Punishment" is a procedure, while a "punisher" is the event which produces a decrease in rate of responding (Matson & DiLorenzo, 1984). An aversive procedure, on the other hand, has been defined as "any procedure that systematically provides a punishing consequence " (Egelston, Sluyter, Murie & Hobbs, 1984, p. 306), or as "any intervention that is applied as a result of a person's behaving in certain disapproved ways, and that is intended to have or has the effect of producing physical or emotional pain or discomfort" (Turnbull et al., 1986, pp. 167-168). Aversive stimuli have been referred to as "events that are noxious, uncomfortable, or painful to the individual,"(Lovaas & Favell, 1987), and as

classes of stimuli that are followed by escape or avoidance behavior (Horner, Dunlap, Koegel, Carr, Sailor, Anderson, Albin, & O'Neill, in press). This latter definition encompasses negative reinforcement, avoidance, and escape procedures, and illustrates the diversity of definitions in the literature for "aversives" or "aversive procedures."

Dimensions of restrictiveness have also been identified, although there is extreme variability in views of degrees of restrictiveness. Researchers have established a number of criteria in order to determine the restrictiveness of particular types of treatment. Killebrew, Harris, & Kruckeberg (1982, p. 368) define restrictive procedures as those which: "1) will have long-lasting, undesirable effects on the individual; 2) are highly intrusive upon the individual's repertoire of behavior; 3) involve a high risk of physical pain or harm; and 4) will unintentionally decrease adaptive behaviors." Other researchers have related restrictiveness to characteristics of both the treatment and the setting. Kloss (1980) sees restrictiveness as reflected in elements such as: "1) the status difference between patients and staff; 2) the amount of control the client has over resources; 3) the degree to which the treatment is mediated by the client's own behavior; and 4) reversibility of treatment, length of application, and the clarity of goal definitions" (Kloss, 1980, p. 422).

Aversive Techniques and Ratings of "Aversiveness"

There is considerable disagreement regarding the relative "aversiveness" of particular approaches. The fact that individuals differ with respect to what stimuli they find aversive and to what degree they do so, makes it difficult to define a concrete set of punishing stimuli or to rate these in some order (Horner et al., in press). Researchers have attempted to create hierarchies of intrusiveness or aversiveness, based on the doctrine of least restriction, legal or behavioral opinion, or survey results (Morgan, 1989). On the basis of their sample of 67 experts in behavior analysis, Meunier et al. (1983) identified a continuum of perceived aversiveness. Their sample rated chemical and electrical stimuli as the most aversive procedures, followed in decreasing order of aversiveness by mechanical restraint, time out, overcorrection, response cost, social disapproval, extinction, satiation and DRO procedures. Lennox et al. (1988) also rated treatments on a continuum of intrusiveness. Techniques such as environmental change, reinforcement, and instruction were defined as Level 1 procedures, procedures such as extinction, overcorrection , and visual screening as Level 2 procedures, and techniques such as noxious chemicals/tastes and contingent electric shock were categorized as Level 3 procedures, the most intrusive level.

Categorizations of levels of intrusiveness such as these are problematic, given that there is some disagreement regarding the intrusiveness of certain

procedures. There is uncertainty about the restrictiveness of overcorrection procedures, for example, due to the fact that researchers differ as to whether overcorrection is a punishment procedure, or should be classed somewhat lower on the continuum of intrusiveness (MacKenzie-Keating & McDonald, 1990). The term "overcorrection" itself, has also been used to refer to a variety of complex procedures (MacKenzie-Keating & McDonald, 1990), and this uncertainty due to multiple labels and different procedures contributes to the confusion regarding levels of restrictiveness or intrusiveness.

There seems to be some general agreement regarding the restrictiveness of procedures such as electric shock and physical striking . In studies not based on survey results, i.e., based on behavioral or legal opinion, electric shock and physical striking were rated as most intrusive by Birnbrauer (1978), Heads (1978), and Brakman (1985). Killebrew et al. (1982), on the basis of their sample of mental health professionals, rated the following procedures on a continuum from least to most restrictive: Differential reinforcement of incompatible behavior, response cost, exclusion time out, extinction, differential reinforcement of other behaviors, overcorrection, seclusion time-out, contingent restraint, psychotropic medication use, and contingent aversive stimulation. Of course, definitions of "restrictiveness" or relative aversiveness such as these have been shown to be specific to the seriousness of the behavior involved in each particular situation (Morgan, 1989).

Clearly, however, there is not a universal consensus on degrees of restrictiveness, and the distinctions between aversive and non-aversive

procedures are also unclear. Guess et al. (1987) categorize punishment, negative reinforcement, and overcorrection as types of aversive therapy. Egelston et al. (1984) list restraint, time out, response cost, and electric shock as examples of aversive procedures. Matson & DiLorenzo (1984) categorize electric shock, noxious substances, and physical and verbal reprimands as punishing stimuli, and time out, physical restraint, overcorrection, response cost, negative practice, and extinction as punishment procedures. Lovaas and Favell (1987, p. 313) view contingent noxious tastes, physical contact, a painful physical stimulus, and intensive physical effort as aversive procedures, and temporary removal of access to reinforcement, for example contingent restraint and exclusionary timeout, as restrictive procedures.

Social Acceptability Ratings of Procedures

A considerable amount of research has been directed toward the determination of the relative social acceptability of procedures used to decrease maladaptive behavior. Kazdin (1977) examined the acceptability of four decelerative techniques using undergraduate college students as subjects. Overall, students rated differential reinforcement of incompatible behavior, time out, drug therapy, and electric shock in that order, from most to least acceptable. Kazdin also found that these ratings were independent of the particular case descriptions received by subjects. Using a vignette methodology, Spreat, Lipinski, Dickerson, Nass, and Dorsey (1989) evaluated the acceptability of

response contingent electric shock (RCES), by surveying mental retardation professionals. They found that RCES was rated as more appropriate when the behavior was of a serious nature, at a high frequency, and had not improved when treated with less intrusive therapies. The severity of the behavior, then, to some extent influences acceptability of particular techniques, although certain procedures may be viewed as less desirable or appropriate in certain settings or situations.

Definition and Examples of Nonaversive Procedures

The nonaversive approach is a developing technology of alternatives to punishment, which includes a number of specific techniques that have been shown to reduce severe behavior problems, as well as an ideology of "positive behavioral support" (Horner et al., in press). This ideology involves, among other things, an emphasis on lifestyle change and teaching adaptive behavior, the consideration of the influence of ecology and setting, and, of course, a decision to minimize the use of punishers (Horner et al., in press). It also incorporates a "dignity standard" which emphasizes the personal dignity of the individual in relation to behavioral treatment (Horner et al., in press). In addition, more restrictive emergency procedures are recognized to be necessary as crisis intervention strategies in the short-term. However, these are not seen as substitutes for effective programming (Horner et al., in press). Restraint, for

example, may be necessary to prevent harm to a client or others, but is not seen as an intervention or long-term treatment option in itself.

Nonaversive strategies for solving behavior problems can consist of a) positive programming, and b) direct intervention techniques (LaVigna, 1987). Positive programming techniques include preliminary functional or pragmatic analyses of the problem behavior (e.g., Bird et al., 1989; Donnellan, LaVigna, Zambito, & Thvedt, 1985), in which possible hypotheses regarding the functions of behaviors are considered. An intervention based on these hypotheses can then be developed. Here inappropriate behavior is validated in the sense that maladaptive behavior is seen to serve some function for the individual. The goal of intervention is to replace the inappropriate behavior with a socially acceptable one that serves the same function. Communicative interventions, and curricular or environmental changes, are types of interventions that may result from functional analysis.

Direct intervention techniques include the application of schedules of reinforcement, such as Differential Reinforcement of Low Rates (DRL), Differential Reinforcement of Other Behavior (DRO), and Differential Reinforcement of Incompatible Behavior (DRI) (LaVigna & Donnellan, 1986). Other nonaversive techniques include: antecedent manipulations, in which the stimuli which may set the occasion for the problem behavior are changed or eliminated; respondent conditioning procedures, systematic desensitization for example; instructional control strategies, in which a response is brought under the control of instructional cues or prompts; and multicomponent or additive

interventions, which involve the combined use of a number of nonaversive techniques (Horner et al., in press; LaVigna & Donnellan, 1986). Sensory stimulation as well as other alternate forms of reinforcement have also been applied (e.g., Dura, Mulick, & Hammer, 1988; Smith, 1986).

Summary

There is a diversity of definitions of "aversive" and "punishment" procedures and their relative restrictiveness, and these definitions are to some extent situation-specific. However, more "intrusive" or "restrictive" procedures are also overall seen to be more aversive or unpleasant. Less intrusive alternatives, on the other hand, are still in an early stage of development and the technology is less diverse. At this point in time, the values in this issue may be more well-defined than the technology involved (Horner et al., in press).

A number of guidelines or recommendations have been proposed for the appropriate use of intrusive procedures. These are presented in the following chapter, and the operationalized definitions of these criteria are presented in Chapter 6 of this thesis.

CHAPTER 3. CRITERIA FOR THE APPROPRIATE USE OF DECELERATIVE PROCEDURES

A number of legal and ethical issues underlie criteria for the appropriateness of behavioral interventions. These include the legal right to treatment, the doctrine of the least restrictive alternative, the rights of procedural due process and informed consent, the right to refuse treatment, and the roles of social and empirical validation. It should be noted that it is not the intent of the present proposed investigation to examine constitutional or judicial differences in Canadian or American law with respect to the use of decelerative procedures. Some of the principles discussed here are derived from the American Constitution. However, these issues have parallels in Canadian law, and have become international doctrines in the sense that they are accepted as principles and rights in both countries. The major principles are defined briefly, with reference to their derivation from American law. These issues as they apply to the treatment of mentally handicapped clients, and the criteria derived for evaluating the literature, are also discussed in the following section.

The Doctrine of the Least Restrictive Alternative and the Right to Treatment

The least restrictive alternative and right to treatment doctrines are derived from the concept of substantive due process, which is in turn derived from the Fifth and Fourteenth Amendments of the American Constitution (Turnbull, Ellis,

Boggs, Brooks, & Biklen, 1981). Substantive due process places limitations on the power of the State, in that it cannot place certain restrictions or limitations on the freedom of its citizens. The least restrictive principle is intended, in turn, to balance government intervention with the needs of the individual citizen (Turnbull et al., 1981). It holds that when the government must intervene in the lives of its citizens, it must do so in the least intrusive or limiting manner possible. Substantive due process therefore implies that the State is limited in its power to deny mentally handicapped clients necessary therapeutic treatment (i.e., there is a right to treatment or habilitation) (Turnbull et al., 1981). The least restrictive alternative doctrine, in turn, dictates that the treatment provided must be of the least intrusive nature possible.

The right to treatment and least restrictive alternative doctrines derived from substantive due process, have implications in the conceptualization of society's obligation to mentally handicapped persons. A number of researchers have emphasized the client's right to the least restrictive yet effective treatment procedures available (e.g., Daniels, 1986; Foxx, 1982; Lovaas & Favell, 1987; Schopp, 1984; Van Houten et al., 1988). The treatment provider's legal obligation to provide treatment, the qualifications of the therapist, and the characteristics of the behavior in question which justify use of more restrictive procedures, are related issues.

Right to Treatment

Foxx (1982), Lovaas & Favell (1987), and Van Houten et al. (1988) emphasize the client's right to the least restrictive yet effective treatment procedures available. The least restrictive principle and documented success in similar cases is seen as adequate justification for the use of more intrusive (i.e., aversive) procedures (Daniels, 1986). There is also the implication that therapists who have accepted responsibility for the care of incompetent patients, are legally obligated to provide the most appropriate, least restrictive treatment possible. It has been argued that therapists may actually have some legal obligation to use punishment in situations in which the dangerous nature of the presenting condition is such as to balance out the possible effects of the punishment procedure (Schopp, 1984, p. 199). The APA Division 16 resolution (1981; as cited in Maurer, 1983, p. 274)also supports the use of punishment, "in rare threatening instances, or when... [development is threatened].:. in such a way that [the behavior] is clearly more destructive than the aversive stimuli."

Clear Benefit to the Client

Skinner (as cited in Griffen et al., 1988, p. 104) asserts that the use of aversives is justified by clear benefit to the client, in cases of " self-destructive or other excessive behavior." It should also be shown that the individual client

rather than others will benefit from the proposed treatment (Martin, 1975). Favell et al. (1982, p. 542) apply the "clear benefit" argument to the use of shock procedures. They argue that shock treatment should only be used in extreme cases, in which "the client is in imminent and extreme physical danger, or when self-injurious behavior is so intrusive as to prevent participation in habilitative and humanizing activities."

According to the above criteria, severe behavior problems interfere with the acquisition of appropriate behavior and warrant intrusive measures, and the therapist is in fact legally obligated to provide intrusive treatment. Presumably, the potential benefits of aversive therapy balance out any negative effects the procedure may have (Irvin & Singer, 1984; as cited in Horner et al., in press). That is, the level of intrusiveness of the intervention should be balanced by the value of the anticipated behavior change for the client (Horner et al., in press). There must also be objective data suggesting the need for intervention (Repp & Deitz, 1978), in order to weigh the risk-benefit ratio in each particular case.

Least Restrictive Alternative Doctrine

Punishment in a sense is seen as a treatment of last resort, but must be provided given the client's right to treatment and the danger of not providing therapy when the behavior in question is of a serious or life-threatening nature. The least restrictive alternative or least intrusive means doctrine suggests that other, less intrusive approaches must have either already been applied

competently and intensively, with no significant improvement in the behavior, or could actually result in greater harm to the patient (Favell et al., 1982; Repp & Deitz, 1978). Skinner (as cited in Griffen et al., 1988) stresses the importance of trying "nonpunitive" alternatives. The APA Division 16 guidelines (1981; as cited in Maurer, 1983, p. 274)also suggest that punishment procedures are justifiable if less intrusive procedures are unsuccessful "in practice or in the research literature." In other words, if research has shown certain less restrictive techniques not to be effective with a similar client or behavior, according to these guidelines, then the use of aversive stimuli is warranted.

Content and Quality of Treatment

The legal right to treatment argument can be applied not only to the use of aversives to treat maladaptive behavior, but to the overall content and quality of a client's therapeutic program, and the adequacy of treatment goals in particular. Researchers have stressed the right to, and necessity for, concurrent positive programming and functional skill training (Van Houten et al., 1988). That is, aversive procedures must "leave the child free to develop in other ways" (Skinner, as cited in Griffen et al., 1988, p. 104). These procedures should also involve teaching appropriate behaviors or functional alternatives which will receive reinforcement, in order to produce lasting behavioral suppression (Favell et al., 1982; Sobsey, in press). The right to behavioral assessment and continuous evaluation (Van Houten et al., 1988), as well as the necessity for a

functional analysis of the client's environment (Favell et al., 1982), are also seen as aspects of program content subsumed under the right to treatment issue.

The right to treatment issue can also apply to the characteristics of the treatment setting itself, in that treatment must be provided in settings which are "humane, stimulating and therapeutic" (Bailey, 1988, p. 325). There is also the obligation to exercise procedural safety measures in these settings which minimize harm and suffering (Wexler, 1982, p. 204). Institutionalized patients in the United States also have a constitutional right to personal security and freedom from bodily restraint (US Supreme Court, 1982, June; as cited in Wexler, 1982).

A number of procedural criteria have been suggested for the actual implementation of aversive techniques, and are based on the large volume of research on punishment. Researchers have noted that punishment must be made immediately contingent on the undesirable behavior (Desnoyers-Hurley & Sovner, 1983; Favell et al., 1982; Johnson & Baumeister, 1981; Skinner, as cited in Griffen et al., 1988), and that it must also be of initially sufficient intensity (Birnbrauer, 1978). It is also necessary to apply the procedures across settings, situations, and persons, in order to ensure generalization of suppression (Favell et al., 1982). In addition, treatment providers must be prepared to continue some form of treatment on a long-term basis, in order to ensure maintenance of suppression (Favell et al., 1982; Repp & Deitz, 1978).

Effectiveness of Treatment

The "effectiveness" element of the right to treatment issue, implies the necessity for some sort of evaluation of the treatment and its effects on the behavior. Researchers have suggested that the information necessary for this evaluation might include data on the degree, speed, and durability of suppression; generality of effects across situations; the side effects of the procedure (both positive and negative); and the social acceptability of the intervention (Favell et al., 1982; Turnbull et al., 1986). Lovaas and Favell (1987) emphasize the importance of the characteristics of the data generated by the treatment, for example, its reliability and accuracy. Experimental design and the role of the data in clinical decision-making are other types of information necessary to evaluate treatment effectiveness (Lovaas & Favell, 1987), and it has been suggested that regression and phase sequence effects be controlled for (Sobsey, in press). Documentation, including goals for program termination established prior to implementation of treatment, as well as daily and weekly data reviews, is also considered necessary for treatment evaluation (Repp & Deitz, 1978).

Qualifications of Treatment Providers

The legal right to treatment has implications for the necessary qualifications of treatment providers. That is, a client has a right to treatment by a competent

behavioral expert (Van Houten et al., 1988). Schopp (1984) suggests that therapists are legally obligated to maintain the skills and facilities necessary to provide aversive treatment. It has been suggested that staff members as well, must be trained and tested to ensure 100% proficiency in defining the target behavior, data collection, and procedural implementation (Repp & Deitz, 1978). Favell et al. (1982, p. 542) assert that shock programs used to treat self-injurious behavior "should be designed and supervised by only highly qualified behavioral experts with extensive training and experience in treating self-injury." The direct involvement of a qualified, experienced therapist can thus be seen as a component of the "right to treatment," in the sense that treatment, treatment facilities, and the qualifications of the treatment provider must be of high quality. As of yet, however, professional certification or specialization in the application of aversive techniques per se does not exist.

The Rights to Refuse Treatment, Informed Consent, and Procedural Due Process

The rights to informed consent and to refuse treatment, as well as the right to procedural due process, are three other legal issues which have a direct bearing on aversive procedures and the developmentally disabled. Like substantive due process, procedural due process is based on the Fifth and Fourteenth Amendments of the American Constitution, and is defined as " the requirement that before the government deprives an individual of 'life, liberty, or

property,' it must provide him or her with a hearing or procedure to determine the necessity or appropriateness of the deprivation" (Turnbull et al., 1981, p. 21). Procedural due process (termed "natural law" in Canada) is related to the least restrictive means principle, in that a due process hearing is the mechanism whereby a mentally handicapped person or his guardian/ advocate, may point out a less intrusive means to accomplish the goals of the State (Turnbull et al., 1981, p. 22). That is, in the case of treatment, the client is entitled to a hearing or review, in which it is documented that less restrictive or intrusive means of habilitation have been examined or implemented unsuccessfully. The client may also refuse treatment at this time. In the United States, P.L. 94-142 also provides for the right to a series of hearings in the event of disagreement between parents or guardians and educators (Tawney & Gast, 1984).

Informed Consent

Issues of treatment choice are related to the requirement of informed consent and the right to refuse treatment. Legal precedents in American case law have determined that the fullest possible consent must be obtained before treatment is implemented (Turnbull et al., 1981). Three requirements on consent must be satisfied: 1) capacity to consent must be determined; 2) the consent must be voluntary; and 3) the individual must be fully informed of both the benefits and risks involved in the treatment, as well as his basic right to refuse or withdraw

from treatment (Daniels, 1986; Martin, 1975; Repp & Deitz, 1978). In cases in which the client is incompetent and cannot give informed consent, that client's parents, legal guardians, or advocate must consent to the treatment (Desnoyers-Hurley & Sovner, 1983; Favell et al., 1982; Foxx et al., 1986; Repp & Deitz, 1978). There should also be some examination of these persons' capacity to consent (Repp & Deitz, 1978).

Foxx and others (1986) provide guidelines for the use of electric shock treatment, which include a comprehensive informed consent document. The document provides information regarding: previous and alternative treatments, justification for and description of the treatment program, possible side effects of the procedure, initial evaluation of the treatment, special precautions, persons implementing the procedure, staff training, expected behavioral outcome(s), and long-term planning provisions. The document is extensive and provides the information necessary to obtain informed consent.

Due Process Procedures

It has been suggested that the more intrusive an intervention, the greater the need for procedural regulation and some sort of continuous public monitoring mechanism (Horner et al., in press). These mechanisms are designed to lessen the risks of 1) neglect due to withholding appropriate and necessary treatment, and 2) the misuse of those treatment procedures (Egelston et al., 1984, p. 306). The necessity for the involvement of monitoring and evaluation committees has

long been recognized. These "human rights," "behavior management," or "peer review" committees (Egelston et al.,1984; Favell et al.,1982; Lovaas & Favell, 1987; Repp & Deitz, 1978), would be directly involved in the due process procedure. Favell et al. (1982, p. 542) for example, recommend that treatment procedures be reviewed and approved by both a human rights committee and a peer review committee. The latter group would consist of independent experts in applied behavior analysis, while the former committee would be comprised of lay individuals and consumer advocates. Horner et al. (in press), Repp & Deitz (1978), and Wexler (1982) suggest that any planned punishment intervention must be approved in written form by these types of committees, and that the human rights group should actually witness the procedure being applied. Repp & Deitz (1978) also suggest that procedural implementation be videotaped, as an additional form of documentation. Thus, the due process element would consist of some form of hearing and direct, periodic observation by all persons involved, as well as ongoing documentation of treatment.

Social and Empirical Validation Issues

Social and empirical validation criteria for the use of aversive treatments are ethical rather than legal issues. They are related to the principle of normalization (Wolfensberger, 1972), and emphasize the importance of the social acceptability of behavioral techniques, and the effects these procedures have on the client's life situation. Acceptability refers to judgments by lay

persons, clients, and others of whether behavioral procedures are appropriate, fair, and reasonable for the problem or client (Kazdin, 1980, p. 259). Wolf (1978) emphasizes that others in society must view the treatment procedures as appropriate. Treatment goals must also be seen as significant, and the effects of treatment, including unexpected ones, must be believed to be socially important by treatment consumers and others. In essence, in order to be socially valid, behavioral interventions must maintain and support the dignity of the individual (Horner et al, in press). Community members must also concur that the intervention is not "dehumanizing, degrading, or disrespectful of the individual receiving support" (Horner et al., in press, p. 14), in order for the procedure to have social validity.

Of interest to the present study, is the issue of whether the social acceptability of the particular aversive treatment is determined in the course of due process proceedings. Favell et al. (1982) recommend that the Human Rights Committee, composed of lay individuals and consumer advocates, witness and approve the treatment. The client's guardians, as well, must consent to the treatment, in order to satisfy the requirement of informed consent. However, social validation also implies some sort of review or evaluation of the acceptability of the technique both initially and during treatment. That is, parents or significant others are asked to rate the acceptability of the proposed treatment, or how satisfied they are with the results of treatment. Some consideration of the acceptability of the treatment to consumers beforehand is therefore

recommended, and the social validity of the end results of treatment should also be determined (Kazdin, 1980).

Empirical validity is related to social validity, and is defined as "the need for evidence that a particular accomplishment will make a difference in the ability of an individual to participate in current and future community environments and activities" (Evans & Meyer, 1985, p. 144). The empirical validity, then, of an aversive intervention, might involve the degree to which the resultant behavior change leads to meaningful participation in less restrictive environments. Also, if the behavioral improvement produced by the treatment allows the client to participate in a wider range of educational or community activities, then it can be said that the treatment has empirical validity.

Consideration of the Influence of Psychotropic Medication

It has been estimated, on the basis of survey results, that approximately 70% of institutionalized mentally retarded persons, and 45% of mentally handicapped persons residing in community placements, are receiving psychotropic and/or anticonvulsant medication (Delaney & Poling, in press, p. 7). The decelerative literature has typically lacked documentation of treatment with medication (Delaney & Poling, in press), although this type of treatment can interact with behavior modification interventions. Therefore, concurrent treatment with medication should also be documented in the research literature, and some evaluation of this potential influence is desirable.

Summary

The above criteria for the use of decelerative procedures, which include legal issues, empirical and social validity questions, and consideration of the characteristics of treatments and behaviors, form the basis for the present inquiry. The criteria discussed above were operationalized., and the research questions which resulted are divided into seven categories. These are: 1) the least restrictive means; 2) effectiveness of procedures; 3) qualifications of treatment providers; 4) quality of treatment indicators; 5) rights of consent and due process; 6) social and empirical validation; and 7) consideration of the influence of medication. There are a total of 39 criteria. The research questions derived from the criteria discussed above, and a listing of the references from which each question was derived, are presented in the Methods section of this paper. The literature on behavior management interventions will be examined with respect to the above criteria and research questions, in an attempt to discover how adequately this research satisfies the criteria set forth by researchers in support of the use of intrusive procedures.

CHAPTER 4. METHOD AND PROCEDURES

Sample and Procedure

Literature Search- Criteria

A topic search was conducted using Psychological Abstracts and Special Education Abstracts, in order to identify criteria that have been proposed for the appropriate use of intrusive decelerative treatments. A total of 39 major criteria were identified, and these guidelines were operationalized in order to assess the empirical literature. These are presented in the following section.

Operationalized Definitions of the Criteria

Least Restrictive Means

1. Type of behavior involved (APA Division 16 Resolution, 1981, as cited in Maurer, 1983; Favell et al., 1982; Horner et al., in press)
2. Severity of behavior (Foxx et al., 1986; Schopp, 1984; Skinner, as cited in Griffen et al., 1988)

a) Of a socially stigmatizing/ socially unacceptable nature

b) Socially stigmatizing/ socially unacceptable and documentation of tissue damage

c) Socially stigmatizing/ socially unacceptable and life-threatening

d) Socially stigmatizing/ socially unacceptable, plus documentation of tissue damage and threat to life

3. Clear benefit to the client (Favell et al., 1982; Horner et al., in press; Skinner, as cited in Griffen et al., 1988)

a) The client and not others would potentially benefit from the treatment (Martin, 1975).

4. Behavior must interfere with the acquisition of appropriate behavior (Favell et al., 1982)

5. Some form of ecological validation or functional analysis was carried out (Favell et al., 1982).

6. Measures of "excessiveness" such as social validation were carried out prior to the study (Evans & Meyer, 1985; Wolf, 1978).

7. Non-aversive means were tried first (APA Division 16 Resolution, 1981, as cited in Maurer, 1983; Repp & Deitz, 1978; Skinner, as cited in Griffen et al., 1988).

8. Other, less intrusive procedures had been tried before (Favell et al., 1982; Lovaas & Favell, 1987; Repp & Deitz, 1978)

9. Effect and adequacy of these previous application(s) was assessed (Favell et al., 1982; Repp & Deitz, 1978).

10. The purpose of or rationale for the study involved treatment for a particular disorder, and/or was relevant to research goals (APA Division 16 Resolution, as cited in Maurer, 1983).

11. Any risk of harm from the procedure has been documented (Wexler, 1982).

12. Safety procedures/ precautions were in effect (Wexler, 1982).

Effectiveness of Procedure.

1. Study involved an adequate research design (Lovaas & Favell, 1987).

a) Case study.

b) Group experimental.

c) Single subject design.

(i) The behavior was at a stable baseline rate/level prior to commencement of treatment.

(ii) The influence of phase-sequence effects was controlled for or considered (Sobsey, in press).

(iii) The influence of regression in the data was considered (Sobsey, in press).

2. The treatment should reduce or eliminate the inappropriate behavior (Favell et al., 1982; Lovaas & Favell, 1987).

3. The behavior did not return to baseline/preintervention level at any point in the treatment (other than during reversal or return to baseline conditions) (Favell et al., 1982; Repp & Deitz, 1978).

4. Side effects (positive or negative) were documented (Foxx et al., 1986).

5. Interobserver reliability checks were carried out (Lovaas & Favell, 1987).

6. A maintenance phase was instituted, or there was evidence for maintenance of treatment gains (Favell et al., 1982; Guess et al., 1987; Lennox et al., 1988; Repp & Deitz, 1978).

7. The study included programming for generalization, or evidence that generalization had occurred (Guess et al., 1987; Lennox et al., 1988; Starin & Fuqua, 1987).
8. Long-term treatment conditions were in effect (Favell et al., 1982; Repp & Deitz, 1978).
9. Follow-up data were reported.
10. Positive procedures were applied concurrently (Favell et al., 1982).
11. An alternative behavior was reinforced (Favell et al., 1982).
12. Functional alternatives were reinforced (Donnellan et al., 1984).
13. Communicative interventions were applied (Donnellan et al., 1984)
14. Improvements were noted in desirable behaviors (Donnellan et al., 1984).

Qualifications of Treatment Providers

1. The qualifications of the treatment supervisor (who should be a trained behavior analyst familiar with and experienced in treating severely maladaptive behavior) were documented (Favell et al., 1982).
2. Treatment providers experienced the treatment themselves (Foxx et al., 1982).
3. The competencies of others involved in the program were assessed prior to commencement of treatment (Repp & Deitz, 1978; Van Houten et al., 1988).

Quality of Treatment

1. A concurrent positive program or functional skill training program was conducted (Favell et al., 1982; Repp & Deitz, 1978).

Rights of Consent and Procedural Due Process

1. Some form of due process procedure was carried out (Favell et al., 1982; Foxx et al., 1986; Martin, 1975; Repp & Deitz, 1978; Turnbull et al., 1981).
2. There is documentation that Human Rights or Behavior Management committees were involved (Egelston et al., 1984; Horner et al., in press; Repp & Deitz, 1978; Wexler, 1982).
3. Some type of independent review was conducted prior to initiation of treatment (Favell et al., 1982; Horner et al., in press).
4. There should be some documentation that informed consent was obtained (Daniels, 1986; Desnoyers-Hurley & Sovner, 1983; Favell et al., 1982; Foxx, 1982; Foxx et al., 1986; Martin, 1975; Repp & Deitz, 1978).
5. Capacity to consent was evaluated (Repp & Deitz, 1978).

Social and Empirical Validation

1. Social validation measures were done at some point in the treatment (Evans & Meyer, 1985; Horner et al., in press; Kazdin, 1980; Wolf, 1978).

2. Some form of empirical validation of the results of treatment was carried out (Evans & Meyer, 1985).
3. The proposed benefit occurred (Favell et al., 1982; Horner et al., in press; Skinner, as cited in Griffen et al., 1988).

Medication Evaluation

1. Concurrent treatment with psychotropic medication is documented (Delaney & Poling, in press).

a). There is some evaluation of the effects of the medication on the target behavior (Delaney & Poling, in press).

The literature on aversive behavior management interventions were examined with respect to the above operationalized criteria, in an attempt to discover how adequately this research satisfies the guidelines set forth by researchers in support of the use of punishment procedures.

Decision Rules Concerning Criteria

A number of decisions were made concerning certain ratings. A stable baseline was defined as per Tawney and Gast's presentation of "acceptable" within-condition data patterns (1984, pp. 165 - 167). Studies which did not present data which could be visually inspected could not be rated on this

criterion, and received a rating of "not documented." Ratings on the criterion "treatment effect" included a "reduced" rating, and was defined as any reduction in level from baseline or assessment phases (if a baseline was not presented). This criterion also included an "eliminated" rating, which was defined as either a) at least four consecutive zero data points at the end of the final treatment phase, or b) a final phase mean of zero, if data were presented as bar graphs or in the form of overall phase means.

Regression was considered a possible influence (as per the criterion "consideration of the influence of regression "), when baseline data were either increasing or decreasing in trend prior to implementation of the treatment phase. Phase sequence effects (as per the criterion "consideration of phase-sequence effects"), were considered to be potential influences in studies applying treatment packages or multiple treatments in alternating or successive order. The criterion "long-term treatment" was defined as at least three months of on-going treatment.

Literature Search: Treatment Research

A second topic search on treatment of maladaptive behavior and developmental disabilities was conducted for the years 1985 to 1989, using Psychological Abstracts and Special Education Abstracts. References of published studies were cross-checked as well, in order to provide a comprehensive sample of the decelerative treatment research. A total of 110

studies (55 aversive and 55 nonaversive studies) were identified from twenty journals, including the *American Journal of Mental Deficiency/ American Journal on Mental Retardation, Australia and New Zealand Journal of Developmental Disabilities, Behavior Modification, Behavior Therapy, Behavioral Disorders, Behavioral Residential Treatment, British Journal of Special Education, Education and Training of the Mentally Retarded, Education and Treatment of Children, Journal of Applied Behavior Analysis, Journal of Autism and Developmental Disabilities, Journal of Behavior Therapy and Experimental Psychiatry, Journal of the Association for Persons with Severe Disabilities, Mental Retardation, Journal of Visual Impairment and Blindness, Pointer, Psychology in the Schools, Research in Developmental Disabilities, and Teaching Exceptional Children* (see Table 1 for a listing of the number of studies obtained from various journals). The obtained sample of 110 studies was also categorized into number of aversive and nonaversive studies per year of publication, in order to reveal trends or changes over time.

Criteria for Inclusion and Categorization

A number of decisions had to be made regarding criteria for the inclusion and categorization of studies. A study was included if (a) the stated or implied purpose of the study was to decelerate a maladaptive or undesirable behavior, and (b) at least one of the subjects was reported to have some form of developmental disability. These handicaps included all levels of mental

retardation, in conjunction with disorders such as autism, various types of psychoses and syndromes, and multiple handicaps or sensory impairments. Subjects of all ages were included in the sample.

As in Lennox and others (1988), a *study* was defined as a complete and separate method section. Thus, a multiexperiment paper may have contained a number of discrete studies, and these were tabulated as separate experiments. When a number of treatments were used within a study, and when a combination of behaviors were treated, each of these treatments or behaviors were counted as one treatment in the overall tally. Positive treatments used in conjunction with aversive procedures, however, were not tallied. The criterion "concurrent positive program or functional skill training program was conducted" was designed to provide this type of information.

Decelerative treatments were also rated on a continuum, from most to least intrusive, in order to classify treatments as aversive or nonaversive. These levels of intrusiveness (as modified from Lennox et al., 1988), were as follows: **Level 1 (nonaversive)**: contingency management, environmental change, reinforcement (including DRO, DRL, etc.), instruction, self-management, functional communication training, instructions or demand manipulation, sensory stimulation, task variation, respondent conditioning (relaxation training and systematic desensitization), extinction, and other (peanut butter, fading air splints, and contingent interrupted stories); **Level 2 (aversive)**: social disapproval, verbal reprimand, manual guidance, overcorrection, negative practice, required exercise, protective equipment, and contingent restraint; and

Level 3 (aversive): facial and visual screening, time out, mechanical restraint, spray mist, noxious chemicals and tastes, electric shock, and medication. Treatments utilizing both Level 2 and Level 3 procedures were categorized as Level 2/3 procedures in the analysis of level of intrusiveness of treatment. This was done for clarity and accuracy of presentation, to account for studies using a combination of procedures.

It should be noted that "guided compliance," a form of manual guidance, was initially classified as a nonaversive procedure. It was reclassified as an aversive procedure, and as a result, two studies (Mace, Webb, Sharkey, Mattson, & Rosen, 1988; Slifer, Ivancic, Parrish, Page, & Burgio, 1986) using this procedure were reclassified after the initial rating.

The level of severity of behavior, one of the forty criteria, was also operationalized on the following scale from least to most severe: socially stigmatizing, socially stigmatizing with documentation of tissue damage, socially stigmatizing and life-threatening, and socially stigmatizing with documentation of tissue damage and threat to life. The number of studies involving behaviors as rated on this continuum, was compared with the respective Level 2 and 3 treatment methods employed. In this way, an indication of the severity of behavior versus the corresponding intrusiveness of treatment was provided. A study was categorized as aversive if it made use of any Level 2 or Level 3 treatment, used either singly or in conjunction with Level 1 procedures. A study was categorized as nonaversive if it made use of a Level 1 procedure or a number of Level 1 procedures only. Studies which involved the use of

psychotropic medication as the sole form of treatment (i.e., not in conjunction with any form of behavioral intervention) were excluded.

Treatments in various studies which involved exclusionary and nonexclusionary time out, movement suppression, removal of materials, and contingent observation, were grouped together into the category of time out procedures. Treatments in studies involving negative practice, positive practice, restitution or forced arm exercise techniques, were categorized as overcorrection procedures. Nonaversive treatments which involved command or demand manipulation, such as behavioral momentum analyses (e.g., Mace, Hock, Lalli, West, Belfiore, Pinter, & Brown, 1988) were categorized as "instructions."

Data Collection and Analysis

Information was collected from the text and graphic data of each study regarding the 39 operationalized criteria/ research questions, for example, severity of target behavior, risk of harm, side effects of treatment, long-term treatment conditions, reliability, programming for generalization or documentation that generalization had occurred, due process, informed consent, social and empirical validation, and concurrent treatment with medication. Data regarding type of behavior, treatment, and treatment setting, as well as demographic information regarding number of subjects, their ages, diagnoses, and residential status, were also obtained from each study (see

operationalized criteria, this chapter, and sample data sheet, Appendix 1). Data for all types of criteria and demographic information were recorded for each study in the form of frequency counts, and for all studies in percentages. Additional data for some of the criteria, for example, type of evidence for empirical validity and time at which social validation procedures were carried out, are not presented here.

A number of variables were subdivided, in order to maintain a manageable number of variables. The variable "subject age" was further divided into three categories: "child" (0-12 years), "adolescent" (13-18 years), and "adult" (19 years-on). "Subject diagnosis" was subdivided into seven categories: "severe mental retardation," "profound mental retardation" "moderate mental retardation," "mild mental retardation," "mental retardation," "autism," and "other." The latter category included subjects with disorders such as schizophrenia that were not reported to occur in conjunction with any form of mental retardation. It should be noted that subjects were classified with reference to level of mental handicap rather than the presence of additional disorders. That is, a given study may have reported a subject to have profound mental retardation and autism. That subject would then have been classified as "profoundly mentally retarded." If a given subject were reported as "autistic," without documentation of degree of mental impairment, a subject was classified as "autistic." In addition, subjects who were described as "mentally retarded" or "developmentally delayed," with no additional information regarding extent of mental handicap or specific disorder, were classified as "mentally retarded."

Effectiveness Evaluation

Effectiveness of the various treatments for each subject was also assessed using a procedure modified from Lennox et al., 1988. Treatment effectiveness was computed by dividing the mean of the last four points of treatment phase data by the mean of the last four baseline phase data points, subtracting this value from 1 and multiplying the result by 100, yielding a percentage effectiveness value. Using this formula, it was possible to obtain negative effectiveness values when there were increases in target behaviors over baseline, and these values were included in the evaluation. If fewer than four data points were presented, the phase mean would still be computed.

As in Lennox et al. (1988), if data from single subjects was not available, the treatment effectiveness value was computed for the group. When possible, effectiveness values were also computed for studies in which overall mean phase values were presented (rather than individual data points in graph form), in order to provide a comprehensive assessment of the sample. Also, in certain cases, if baseline data were not available, data from assessment or control phases were treated as baseline data in order to compute an effectiveness value.

Reliability

The reliability of scoring procedures for the individual criteria and demographic data were assessed using a test-retest approach. A random sample of 20% of the studies was rated by the same observer a second time using the operationalized criteria, and demographic data were collected for this sample as in the original sample as well. Reliability was computed by dividing agreements by agreements plus disagreements and multiplying by 100 to yield a percentage of agreement. The reliability of the effectiveness computations between individual phases in the papers was computed from a random sample of 10% of all studies (6 aversive and 6 nonaversive), using a test- retest approach, by dividing agreements by agreements plus disagreements and multiplying by 100. Given that, in most cases, data points had been estimated from graphed data, an individual value was scored as an agreement if it fell within a range of plus or minus 5 points of the original effectiveness percentage.

Percentage reliabilities for each of the operationalized criteria are presented in Table 2. Average test- retest reliability for all of the criteria was 90.4%. With one exception, reliability values for the individual criteria were all above 75%. The criterion "Purpose of study" received a value of 45%, and therefore is not considered to be a reliable criterion. Reliabilities for the remaining criteria ranged from 77% to 100%. Four of the criteria received a rating of 77%, and the remainder were all above 82% on the reliability measure.

Test- retest reliability was also computed for a sample of 20% of all studies (N=22, total 110), and an overall average reliability for all ratings within these studies of 89.69 (average 89.2% aversive and 91.66% nonaversive) was obtained.

Average reliability for demographic data was 97.3%. Average overall reliability for between phase effectiveness values was 93.5%, and ranged from 75% to 100% (see Table 3 for the obtained reliabilities).

Table 1 Number of Aversive and Nonaversive Studies in Sample by Journal

Journal	Number of Studies	
	Aversive	Nonaversive
American Journal on Mental Retardation (previously American Journal of Mental Deficiency)	7	2
Behavior Modification	9	3
Behavior Therapy	4	2
Journal of Applied Behavior Analysis	12	16
Journal of Behavior Therapy and Experimental Psychiatry	11	7
Journal of The Association for Persons with Severe Handicaps	0	11
Journal of Autism and Developmental Disabilities	1	4
Other journals	11	10
Total	55	55

Table 2 Obtained Reliability Values for Criteria

Criteria	Reliability (%)
Proposed benefit	91
Behavior severity	95
Interfering with acquisition of appropriate behavior	100
Ecological validation	86
Measures of excessiveness	95
Nonaversive procedures applied first	91
Other procedures tried before	100
Effect of previous applications	95
Purpose of study	45
Risk of harm	100
Safety procedures in effect	91
Design of study	100
Stable baseline	77
Control phase-sequence effects	77
Control regression	82
Treatment effect	95
Return to baseline	86
Side effects	86
Reliability	100
Maintenance	91

Table 2 Obtained Reliability Values for Criteria (cont'd)

Criteria	Reliability (%)
Generalization	91
Long-term treatment	91
Follow-up	82
Positive procedures	86
Functional alternatives	77
Communicative alternatives	95
Improvements noted in desirable behaviors	77
Qualifications of supervisor	100
Treatment providers experience treatment	95
Competency assessed	82
Concurrent, positive program	95
Due process documentation	95
Independent review	95
Informed consent documented	91
Capacity to consent examined	95
Social validation	86
Empirical validation	82
Proposed benefit achieved	100
Concurrent treatment with medication documented	100

Table 3 Summary of Test-Retest Reliability Values

Type	Average	Range
For criteria, overall	90.4	55
For demographic data, overall	97.3	5.5
For ratings per sample of studies,overall	89.7	
aversive, N=11	89.2	14.6
nonaversive, N=11	91.7	10.4
For effectiveness computations,baseline to treatment phase,N=12	93.5	25.

CHAPTER 5. RESULTS

This study of the published research on aversive and nonaversive techniques, was undertaken in order to assess the extent to which both types of studies conformed to operationalized treatment guidelines. The results of this analysis, as well as the findings regarding demographic information, treatments, behaviors, and effectiveness values, are presented in the following section.

Ratings for the Operationalized Criteria

Least Restrictive Means Criteria

The data for ratings on the operationalized criteria are presented in Figures 1 through 41. The results for the criterion "potential benefit" (see Figure 1), indicate that the majority of both types of treatments would result in improvements which would benefit the clients involved, rather than others. Findings for the criterion "severity of behavior" (see Figure 2), indicate that the majority of both types of studies dealt with behaviors which were the least severe, although a greater percentage of nonaversive studies dealt with behaviors of this type (those judged to be socially stigmatizing only). Studies of the next level of severity, in which the behaviors were socially stigmatizing and had resulted in tissue damage, accounted for 31% and 13% of aversive and nonaversive studies, respectively. Behaviors of greatest severity on the

continuum, which were life-threatening, socially stigmatizing, and had resulted in some form of tissue damage, accounted for only 7% of the total of aversive studies and 2% of nonaversive studies. In the entire sample of both types of studies, these behaviors were judged to interfere with the acquisition of appropriate responses, as per the criterion "interfering with the acquisition of appropriate behavior" (see Figure 3).

In the majority of both types of studies, neither ecological validation nor measures of excessiveness were carried out (see Figures 4 and 5). Documentation for the criterion "nonaversive treatments applied first," was also not provided in the majority of aversive studies (see Figure 6). Not surprisingly, almost all of the nonaversive studies in this sample involved the initial application of nonaversive procedures. An aversive procedure had been attempted initially by other researchers in one nonaversive study, and therefore accounted for the remaining 2% of studies for this type of treatment. Information regarding the previous use of other procedures, and the effects of these procedures, was not presented in the majority of both types of studies (see Figures 7 and 8).

An approximately equal percentage of both types of studies documented the stated purpose of the study as "research," as per the criterion "Purpose of study," presented in Figure 9. A somewhat greater percentage of aversive studies included a stated purpose which fell into the category of "research and treatment."

Risk of harm was not documented in the majority of aversive studies and the entire sample of nonaversive studies (see Figure 10). Safety precautions or procedures were documented to be in effect in only 20% of aversive studies and 9% of nonaversive studies (see Figure 11).

Effectiveness of Procedure

Findings for the criterion "type of research design," reveal that the majority of both types of studies used single subject research designs (see Figures 12). The remaining experiments used case study designs. In only one-quarter of the aversive and 16% of nonaversive papers, had the behavior reached a stable baseline level prior to initiation of treatment (see Figure 14). The target behavior in 60% of aversive and 45% of nonaversive behaviors had not reached a stable baseline level. In 9% of the aversive and 27% of the nonaversive studies, graphic data regarding level or rate of behavior was not presented, and received a "not documented" rating. The criterion "stable baseline" did not apply in 5% and 11% of aversive and nonaversive studies, respectively. This criterion did not apply in situations in which treatment did not include a baseline, as in a case study, or in single subject designs which presented data which could not be inspected visually (e.g., in bar graph form). Muitiple baseline designs were the type of single subject design used most frequently in both types of studies (see Figure 13).

Both types of studies lacked documentation of control for or consideration of the influences of phase sequence effects or regression in the data (see Figures

15 and 16). In situations in which regression was judged to have a possible influence on results (i.e., the trend of the data was either increasing or decreasing prior to the treatment phase), 64% of aversive and 55% of nonaversive studies did not refer to the possible influence of regression. Regression in the data was not documented (i.e., graphic information either was not presented or was presented in a form that could not be inspected visually), in 7% of aversive and 18% of nonaversive studies. Regression in the data was judged not to be a factor in 29% of aversive and 27% of nonaversive treatments.

Phase-sequence effects were controlled for in one-quarter of both types of studies, and were not considered or controlled for in 22% of aversive and 9% of nonaversive studies. This potential influence was not judged to be significant in more than one-half of aversive studies and 65% of nonaversive papers.

The results of ratings on the criterion, "Effect of procedure" (see Figure 17), indicate that treatments resulted in a reduction of the target behavior (i.e., a decrease from baseline levels) in the majority of both types of studies, and eliminated the behavior (i.e., produced a final level of four consecutive zero data points) in fewer studies (13% of aversive and 16% of nonaversive). Treatments resulted in an increase in behaviors in 4% of aversive and 2% of nonaversive studies, had no effect in 2% of aversive studies, and increased appropriate behaviors in 9% of nonaversive studies (these studies did not report data on inappropriate behavior). The behavior returned to baseline levels during treatment phases in almost 40% of aversive studies and 30% of nonaversive papers (see Figure 18).

Side effects of treatment have been a central concern in the debate regarding aversives. Data for this criterion are presented in Figure 19. Negative side effects were documented in a greater percentage of aversive studies, while positive side effects alone were documented to occur in a greater percentage of nonaversive studies (40% of nonaversive studies reported positive side effects versus 31% of aversive studies). Both positive and negative side effects were reported in 11% of aversive studies, and in none of the nonaversive studies . No information regarding side effects was presented in nearly one-half of aversive and more than one-half of nonaversive studies. The majority of both types of studies presented information regarding assessment of reliability (see Figure 20).

Documentation of programming for maintenance or generalization, or evidence for these types of treatment gains, is lacking in both types of research (see Figures 21 and 22). A greater percentage of nonaversive studies contained information regarding maintenance(29% of nonaversive studies compared to 12% of aversive studies). A somewhat higher percentage of aversive studies contained information regarding generalization (58% of aversive applications versus 40% of nonaversive studies). The majority of both types of studies did not report the implementation of some form of long-term treatment (see Figure 23). A greater number of aversive studies reported some type of follow-up treatment or measurement (56% of aversive versus 31% of nonaversive studies) (see Figure 24).

The use of concurrent positive procedures was documented in the majority of both types of studies (see Figure 25). In 11% of nonaversive studies, however, the judgement was made that positive procedures were not concurrently in effect. That is, although the procedure as such was defined as nonaversive, the procedures simply lacked aversive components and did not necessarily involve reinforcement or instruction per se (e.g., Duker & Rasing, 1989).

Data for the criteria of "functional alternatives reinforced" and "communicative alternatives applied" (see Figures 26 and 27), reveal that communicative interventions were applied in only a minority of both types of studies, although more nonaversive than aversive studies used this type of intervention. Functional alternatives were reinforced in a somewhat greater percentage of both types of studies, and more nonaversive papers satisfied this criterion. Improvements were noted in desirable behaviors in a greater percentage of nonaversive studies (see Figure 28).

Qualifications of Treatment Providers/ Quality of Treatment

The majority of both types of studies did not present information regarding the qualifications of treatment supervisors (see Figure 29). None of the nonaversive studies contained documentation that treatment providers experienced the treatment themselves, and less than 20% of aversive studies reported this information (see Figure 30). The results for the criterion "competencies of others implementing treatment assessed prior to treatment," reveal that a greater

percentage of aversive studies contained information in this regard (see Figure 31). Only 20% of nonaversive studies contained this information, versus 44% of the aversive research. The majority of both types of studies documented the existence of a concurrent positive program (see Figure 32), although a greater percentage of nonaversive studies satisfied this criterion.

Rights of Consent and Procedural Due Process

Both types of studies lacked information on the criteria of due process and independent review procedures, informed consent and capacity to consent (presented in Figures 33 to 36). Only 1% of nonaversive studies and 20% of aversive studies contained documentation of some form of due process procedure, and only 4% of aversive and 2% of nonaversive studies referred to some form of independent review. The types of committees involved that were documented in the studies are presented in Table 4. Institutional ethics or human rights committees, and state human rights or behavior therapy committees, were the types of groups most often involved in due process procedures. One-quarter of aversive studies contained documentation of informed consent, and even fewer (only 7%) of nonaversive studies reported this information. Evaluation of capacity to consent was not documented in any of these studies.

Social and Empirical Validation

Both types of studies also lacked information regarding the criteria of social and empirical validation of treatment (see Figures 37 and 38). Documentation of some form of social validation was lacking in the majority of both types of studies, with a slightly greater percentage of aversive research reporting this information. A greater percentage of both types of studies contained evidence for some form of empirical validation. The proposed benefit was achieved in the majority of both types of studies (see Figure 39).

Medication Evaluation

The literature also lacks information regarding medication and this possible influence on behavior (see Figures 40 and 41). Only about one-quarter of both types of studies documented concurrent treatment with medication. Of the studies in which treatment with medication was documented, a slightly greater percentage of nonaversive studies attempted an evaluation of medication effects on the target behavior (e.g., a placebo trial, withdrawal of medication, or medication titration).

Effectiveness Ratings

Effectiveness values were computed from estimated phase means (see Table 5). The average effectiveness values for all baseline to treatment phases

including follow-up phases was 67.1% (range= 663) for aversive interventions and 72.6% (range= 418) for nonaversive treatments. The medians for the effectiveness data from both types of studies were more similar: 90.0 (aversive) and 91.5 (nonaversive). The overall mean effectiveness values for baseline to treatment phases (excluding baseline to follow-up measures) was somewhat higher for nonaversive treatments (70.52 for nonaversive studies [N=75] and 62.23% for aversive treatments [N=105]). The overall effectiveness values for baseline to follow-up phases was 86.6 for nonaversive treatments (N=11), and 95.2% (N=21) for aversive treatments.

Overall treatment effectiveness values were also compared to severity of behavior as conceptualized in the criterion "severity of behavior." These results are presented in Table 6. The mean effectiveness value for behaviors of the greatest severity (those which were judged to be life-threatening and socially stigmatizing, with documentation of tissue damage), were low for both types of treatment (29.3% for aversive procedures and 33.0% for nonaversive procedures). In contrast, the mean effectiveness values for the least severe behaviors (those that were socially stigmatizing or unacceptable), were considerably higher (69.8% for aversive treatments and 64.7% for nonaversive treatments). Finally, aversive treatments were about 15 points higher in effectiveness ratings than nonaversive treatments for treating socially stigmatizing and life-threatening behavior.

Demographic Information

Findings regarding the ages, diagnoses, and residential statuses of subjects, as well as data regarding the settings in which treatment took place, are presented in Figures 42 to 45. A greater percentage of subjects in both aversive and nonaversive studies were children (one-half of the total number of subjects in studies using aversive procedures and 37% of studies using nonaversive treatments). In terms of the diagnostic categories, more subjects in aversive studies were labelled profoundly mentally retarded, while comparatively more subjects in nonaversive studies were labeled severely mentally retarded. These two diagnostic categories are actually quite similar, and this is a relatively arbitrary distinction. If the latter two categories are combined, they account for 45% of subjects in aversive studies and 41% of subjects in nonaversive studies. The greatest number of subjects in nonaversive studies (31% of the total) were described as "autistic."

An examination of residential status revealed that a greater percentage of subjects exposed to aversives resided in institutions, whereas a greater percentage of those clients treated with nonaversive procedures resided in group homes (see Figure 43). Clients who lived with their natural families accounted for only 12% of clients exposed to aversives and 14% of clients exposed to less intrusive procedures.

An analysis of the settings in which treatment took place, revealed that a greater percentage of subjects were treated with aversive therapies in institutional settings, whereas a greater percentage of clients were treated with nonaversive therapies in segregated special education classes (see Figure 45). Treatment was conducted in either integrated classrooms, public settings, or the family home for only 14% of subjects in aversive experiments, and only 12% of all subjects in nonaversive studies.

Behaviors and Treatments

Self-injurious behavior was the most frequently targeted behavior in both aversive and nonaversive treatments (see Table 7). Stereotypy was the second most frequently treated behavior in both types of studies, followed by aggression. Data for treatments used are presented in Tables 8 and 9. Time out and overcorrection were the techniques used most frequently in the aversive studies sampled, followed by visual/ facial screening and contingent restraint, in that order. The most frequently used nonaversive technique was instruction, followed by instructions (demand or command manipulation), and differential reinforcement techniques. A greater variety of procedures were applied in nonaversive studies than in aversive studies (i.e., a total of 16 different procedures were identified in the sample of nonaversive studies, compared to 11 in aversive studies).

Severity of Behavior Versus Level of Intrusiveness of Treatment

Table 10 displays the data regarding behavior severity and level of intrusiveness of treatment. For studies using aversive treatments, slightly more than half of all experiments (N=28) used a treatment defined as the most intrusive type, a Level 3 procedure. Of studies using a Level 3 procedure, 61% (n=17) of the behaviors targeted were rated as the least severe as rated on the continuum of severity (socially stigmatizing or socially unacceptable). In contrast, only 7% of all studies using a Level 3 procedure targeted behaviors of the highest level of severity (life-threatening and socially stigmatizing, with documentation of tissue damage). For studies using a Level 2 procedure, which made up 33% of the total number of aversive experiments, one-half of these studies (N=9) targeted behaviors of the lowest level of severity. The majority of studies using a Level 1 procedure (i.e., nonaversive studies), dealt with socially stigmatizing behaviors (the lowest level of severity).

Year by Year Analysis of Sample

An examination of the number of studies per year in this sample, as presented in Table 11, indicates that the sample contained fewer studies for more recent years. However, the relative number of aversive to nonaversive papers in this sample also changed over time. The number of nonaversive

publications, for example, exceeded the number of aversive publications for the years of 1987, 1988, and 1989.

Table 4 Types of Committees Involved in Due Process Procedures

Type of committee	Type of study	Number of studies
Institution's Ethics or Human Rights Committee	Aversive	4
State-wide Peer Review Committee	Aversive	1
State-wide Human Rights or Behavior Therapy Committee	Aversive	3
Selection and Program Review Committee	Aversive	2
Selection and Program Review Committee	Nonaversive	1

Table 5 Effectiveness Values for Aversive and Nonaversive Studies in Sample

	Type of study	
	Aversive	Nonaversive
Number of studies	55	55
Overall mean	67.1	72.6
Range	-563-100	-318-100
Mean baseline to treatment phases	62.2	70.5
Mean baseline to follow-up	95.2	86.6
Median values	90.0	91.5
Standard deviation	73.7	49.6

Table 6 Severity of Behavior versus Average Treatment Effectiveness

Behavior severity	Type of study	Effectiveness
1. socially stigmatizing	aversive	69.8
	nonaversive	64.7
2. socially stigmatizing, tissue damage	aversive	73.6
	nonaversive	93.2
3. socially stigmatizing, life-threatening	aversive	88.3
	nonaversive	73.5
4. socially stigmatizing, tissue damage, life-threatening	aversive	29.3
	nonaversive	33.0

Table 7 Frequency of Behaviors Treated in Aversive and Nonaversive Studies

Behavior	Type of study	
	Aversive	Nonaversive
Self-injury	19	16
Stereotypy	15	14
Aggression	10	10
Noncompliance	-	7
Pica	4	2
Tantrums	3	4
Disruption	3	5
Destruction	1	3
Inappropriate social	1	2
Inappropriate verbal	5	-
Echolalia	-	3
Rumination	-	2
Air swallowing	3	-

Table 7 Frequency of Behaviors Treated in Aversive and Nonaversive Studies (cont'd)

Behavior	Type of study	
	Aversive	Nonaversive
Other - aversive (aggressive theme play, boundary crossing, stealing)	3	
Other - nonaversive (anger responses, polydipsia,agitation, vomiting, seizure-like behavior, self-restraint)		6
Combination of behaviors	10	14

Table 8 Frequency of Treatments Used in Aversive Studies

Treatment	Frequency
Time out	21
Overcorrection	13
Visual/ facial screening	9
Contingent restraint	8
Spray mist	7
Verbal reprimand	5
Noxious chemicals/tastes	5
Protective equipment	4
Manual guidance	2
Shock	2
Medication	2
Combination of procedures	20

Table 9 Frequency of Treatments Used in Nonaversive Studies

Treatment	Frequency
Instruction	16
Instructions	13
Differential reinforcement procedures	7
Reinforcement	7
Sensory stimulation	4
Functional communication training	3
Fading	2
Respondent conditioning	1
Reinforcer displacement	1
Peanut butter	1
Analysis of helmet conditions/manipulation of interaction conditions	1
Extinction	1
Environmental change	1
Controlled eating	1
Attention control	1
Contingent interrupted stories	1
Combination	19

Table 10 Severity of Behavior Versus Level of Intrusiveness of Procedure

Severity of Behavior	Number of Studies Level of Intrusiveness of Procedure			
	Level 2	Level 2/3	Level 3	TOTAL
1. Socially stigmatizing	9	6	17	32
2. Socially stigmatizing, tissue damage	6	3	8	17
3.Socially stigmatizing, life-threatening	1	0	1	2
4. Socially stigmatizing, tissue damage,life-threatening	2	0	2	4
TOTAL	18	9	28	55

Table 11 Number of Studies in Sample per Year

Year	Number of studies		
	Aversive	Nonaversive	Total
1985	18	10	28
1986	17	15	32
1987	9	10	19
1988	6	13	19
1989	5	7	12
TOTAL	55	55	110

FIGURE 1. Criterion - Potential Benefit

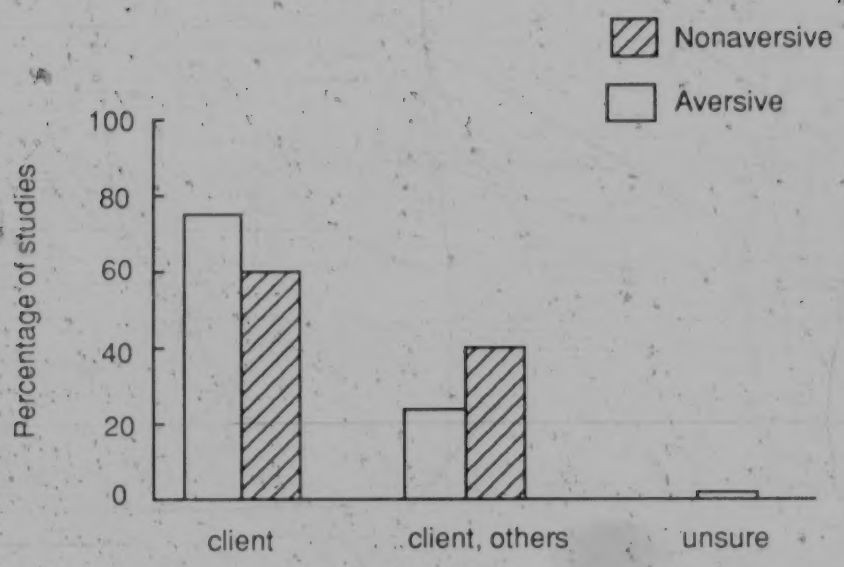

FIGURE 2. Criterion - Severity of Behavior

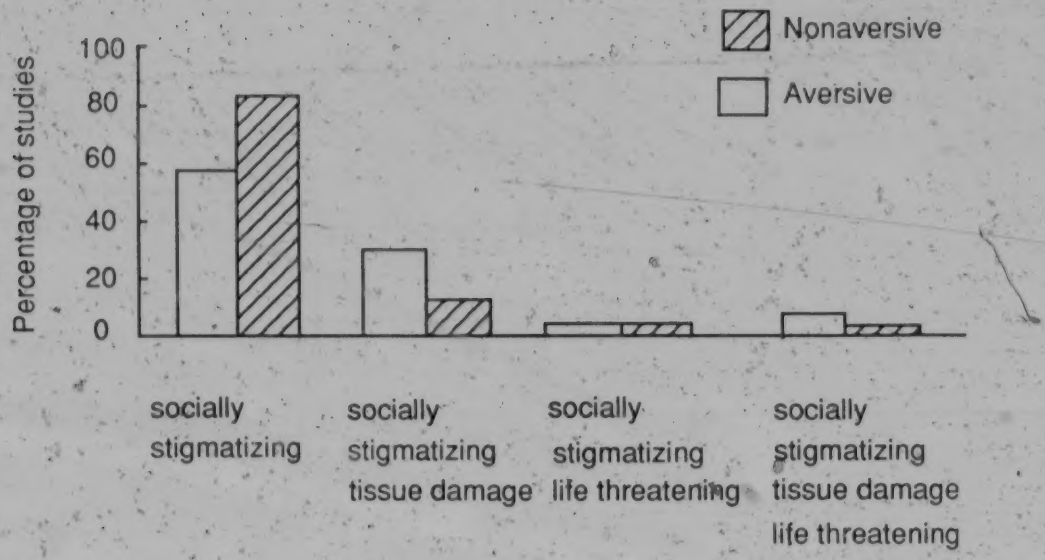

FIGURE 3. Criterion - Interfering with Acquisition of Appropriate Behavior

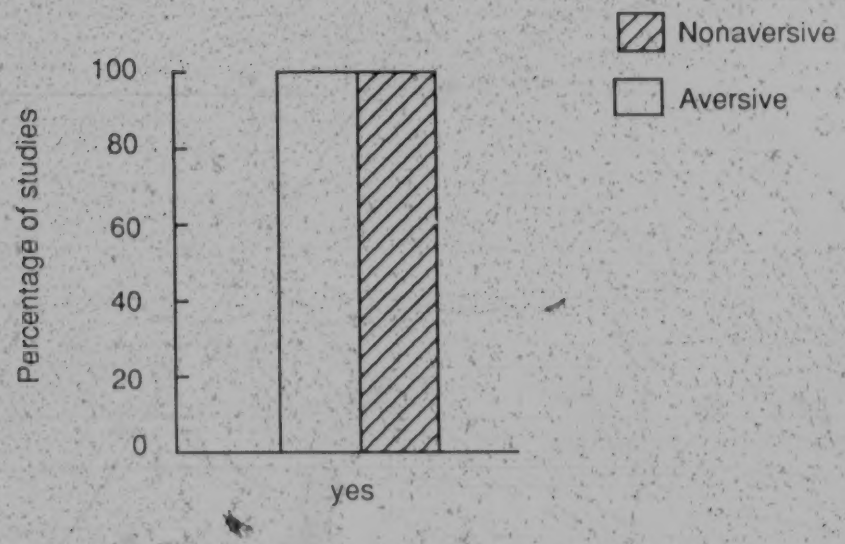

FIGURE 4. Criterion - Ecological Validation

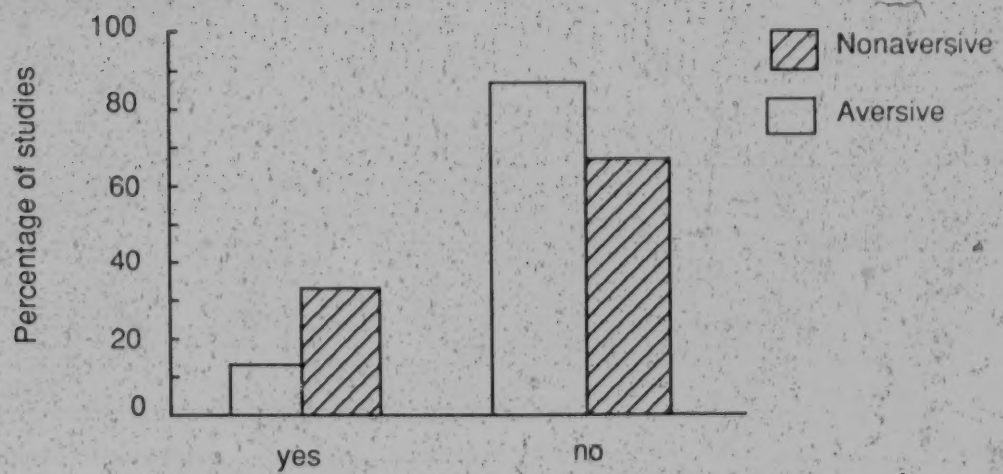

FIGURE 5. Criterion - Measures of Excessiveness

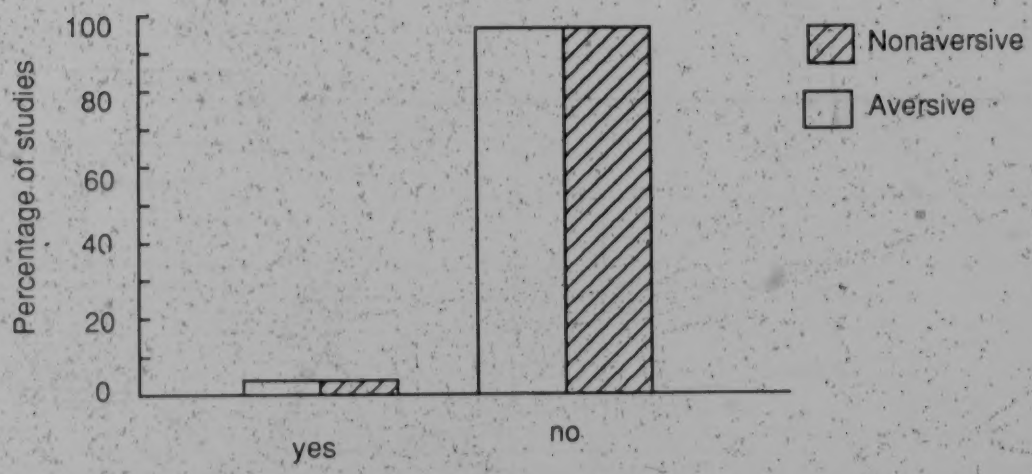

FIGURE 6. Criterion - Nonaversive Treatments First

FIGURE 7. Criterion - Other Procedures Tried Before

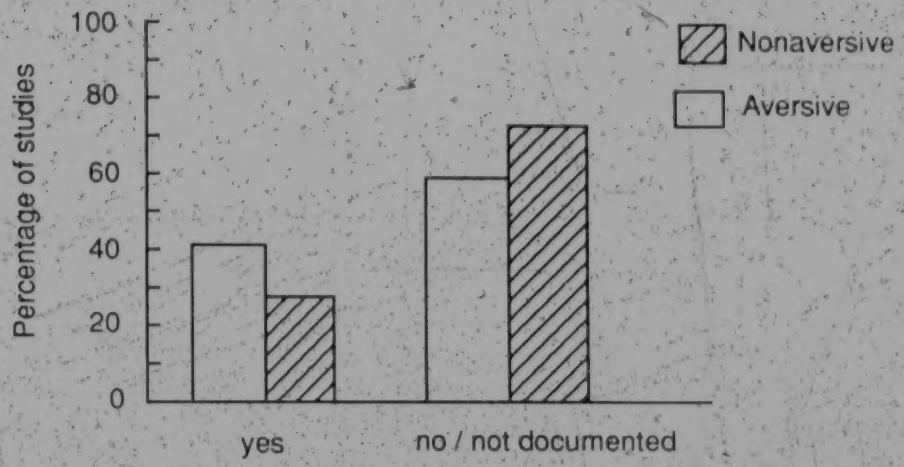

FIGURE 8. Criterion - Effect of Previous Applications

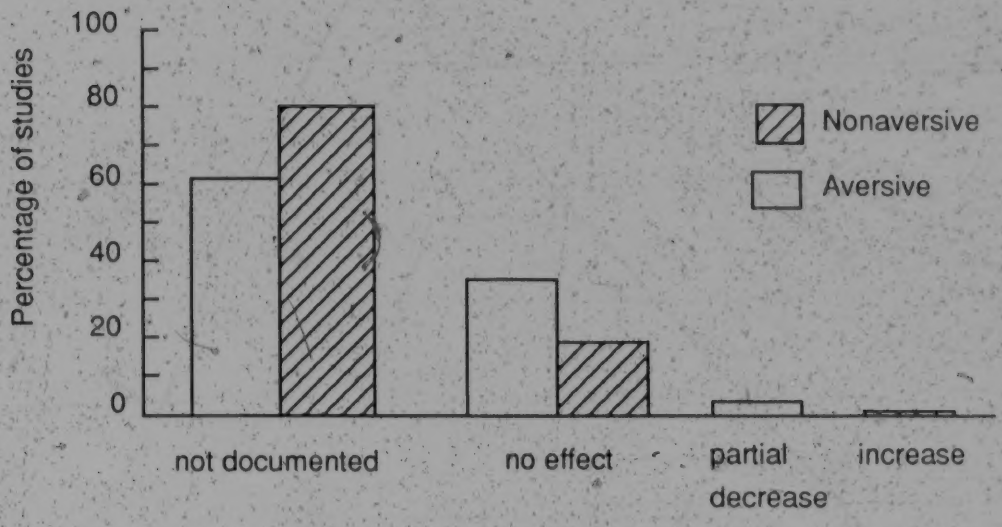

FIGURE 9. Criterion - Purpose of Study

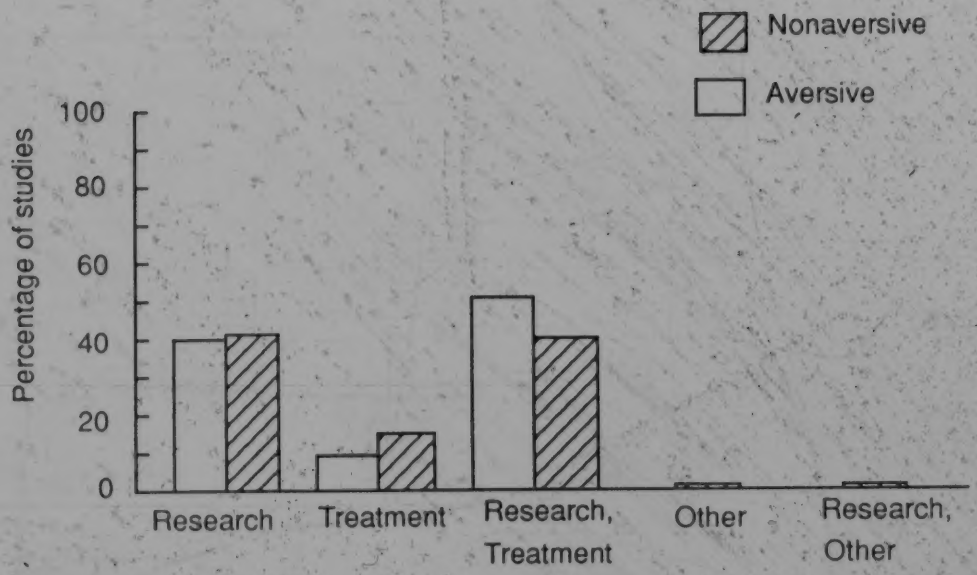

FIGURE 10. Criterion - Risk of Harm

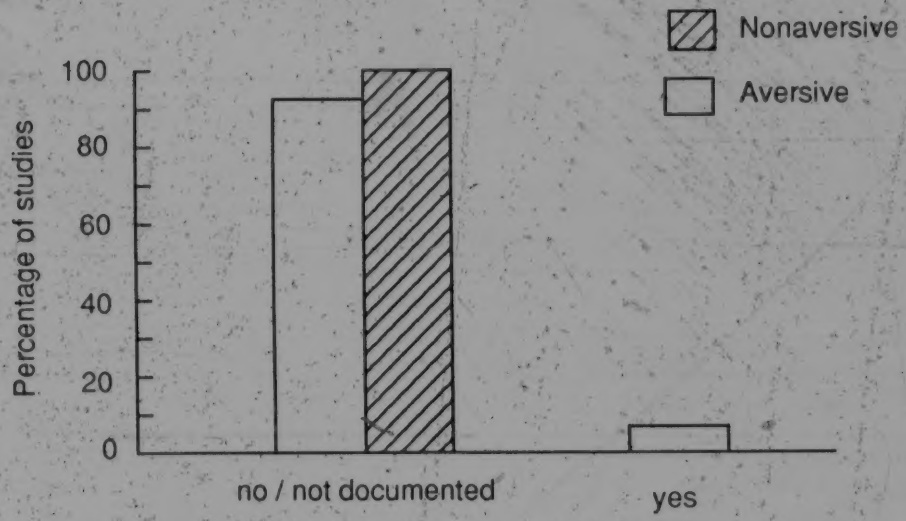

FIGURE 11. Safety Procedures in Effect

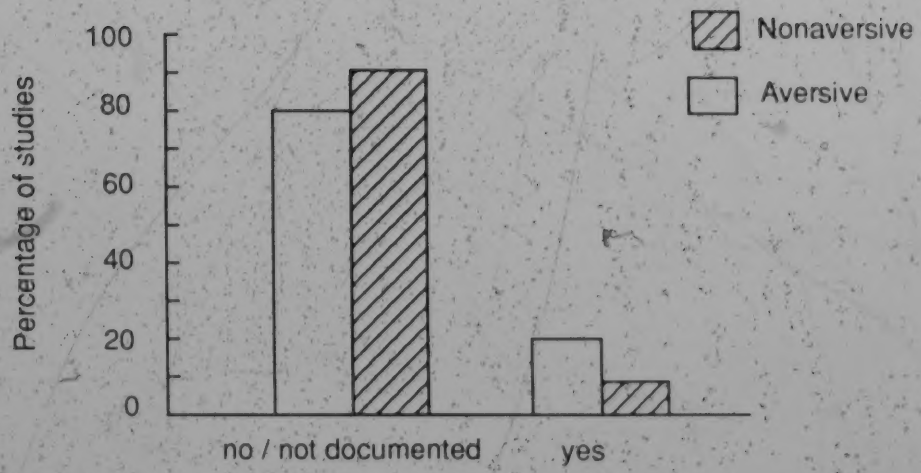

FIGURE 12. Design of Study

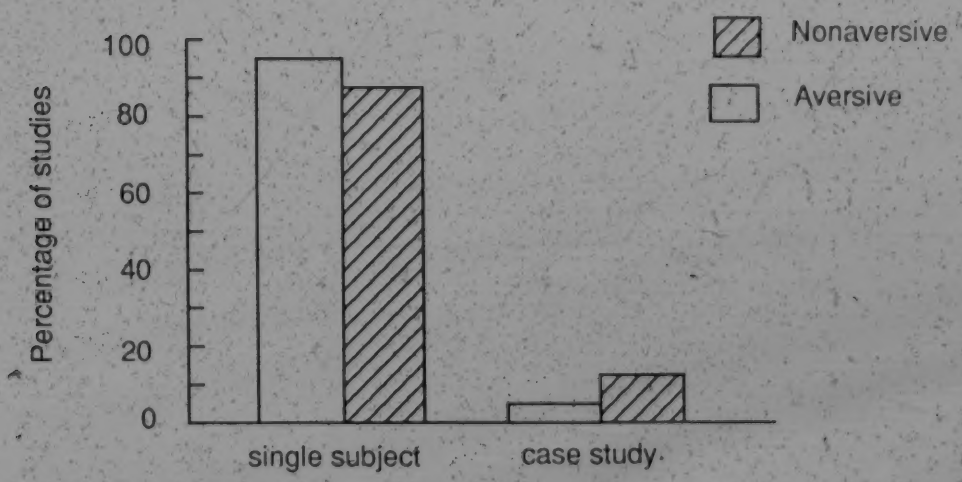

FIGURE 13. Type of Single-Subject Designs Used

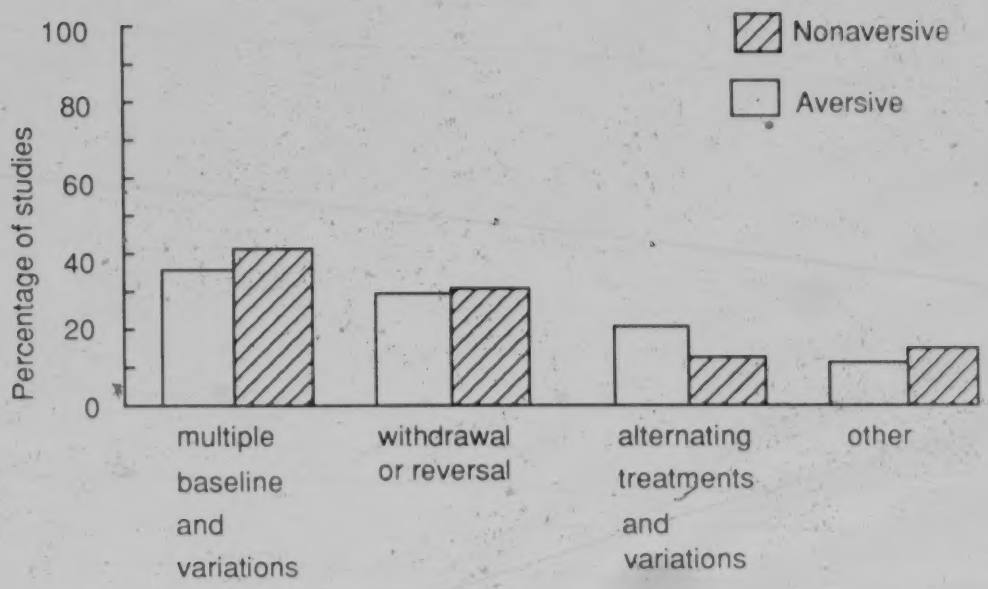

FIGURE 14. Criterion - Stable Baseline

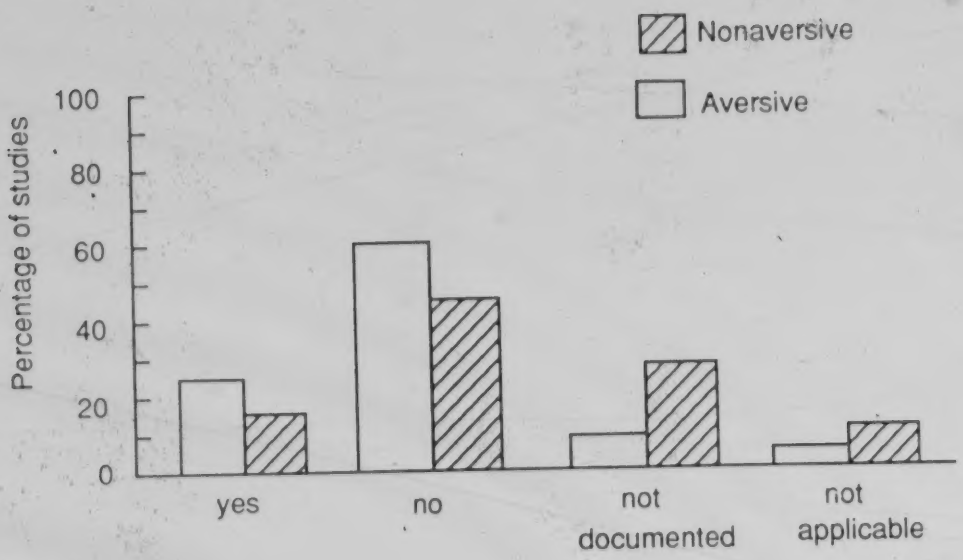

FIGURE 15. Criterion - Control Phase - Sequence Effects

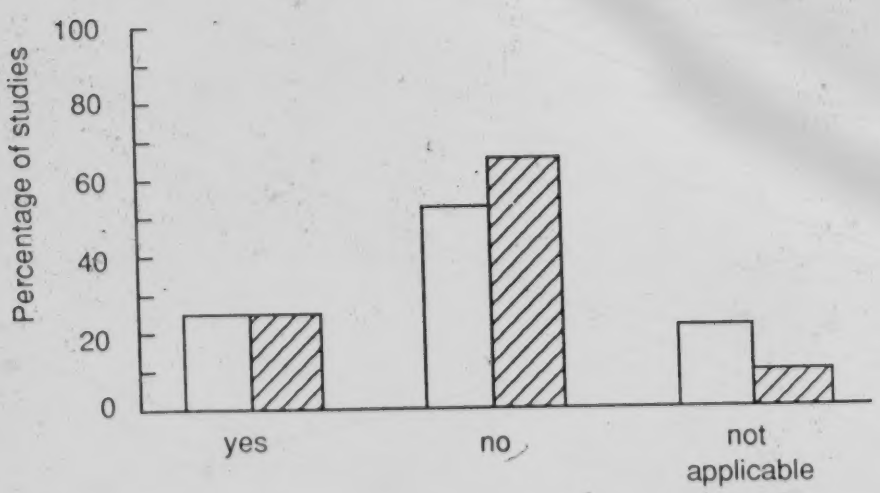

FIGURE 16. Criterion - Control Regression

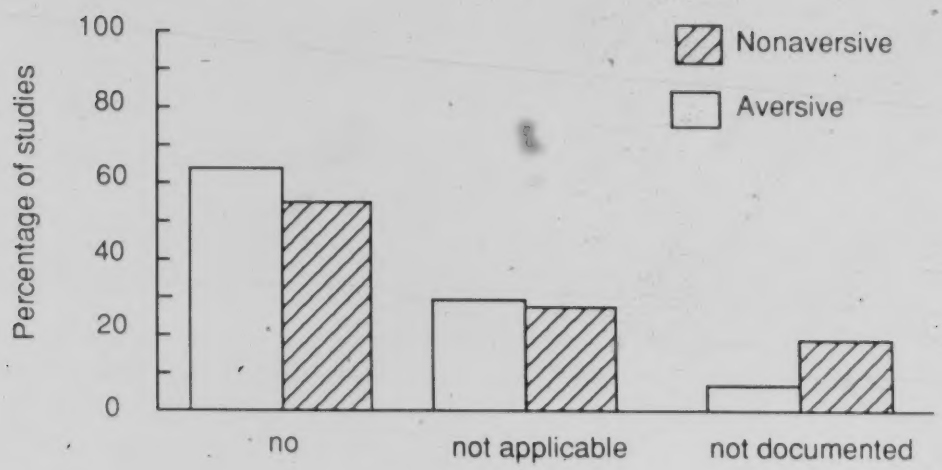

FIGURE 17. Effect of Treatment

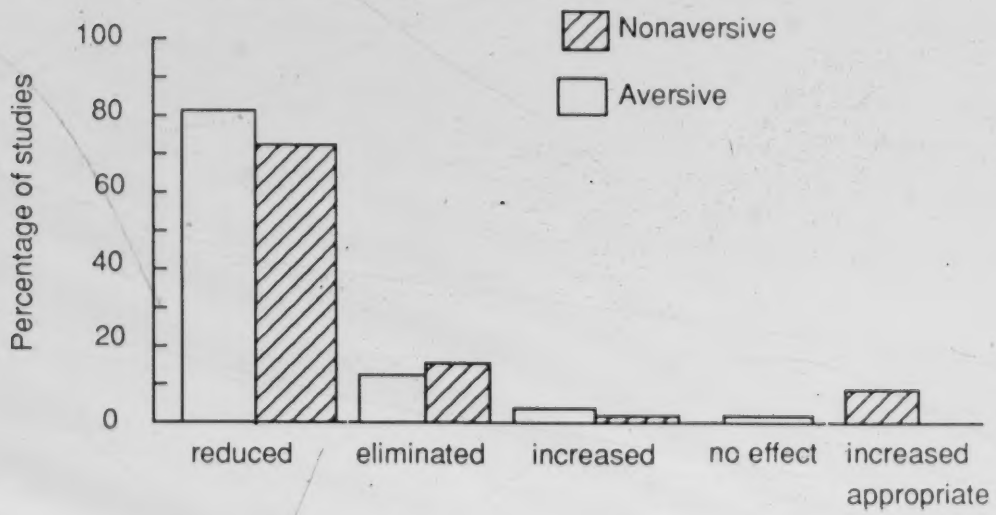

FIGURE 18. Criterion - Return to Baseline

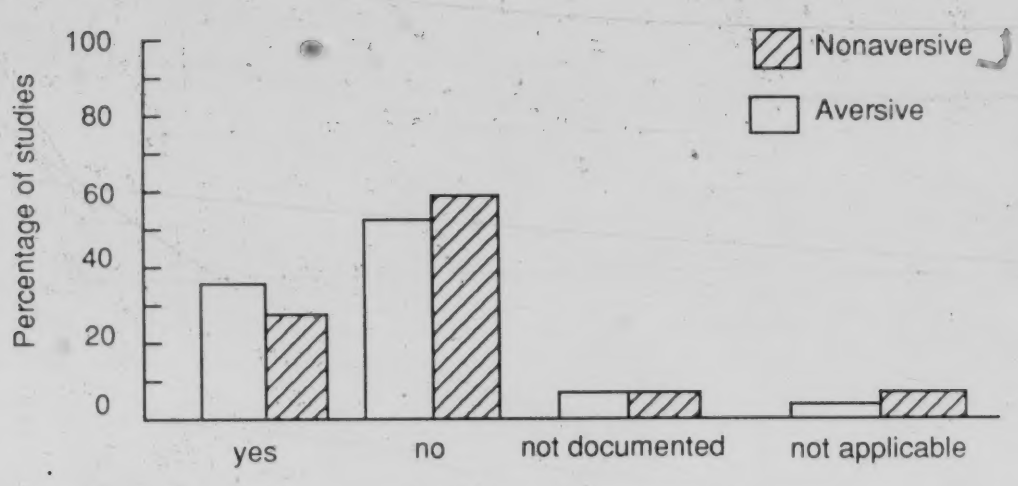

FIGURE 19. Criterion - Side Effects of Treatment

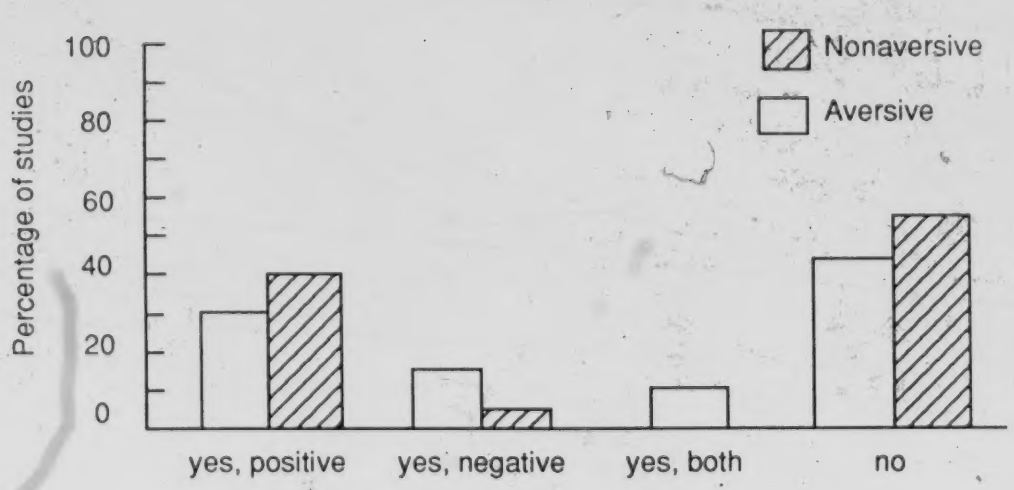

FIGURE 20. Criterion - Reliability Measures

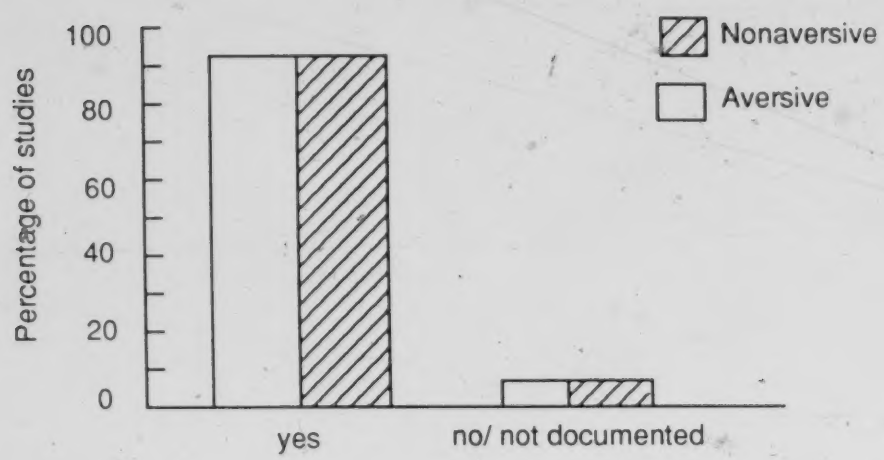

FIGURE 21. Criterion - Evidence of or Programming for Maintenance

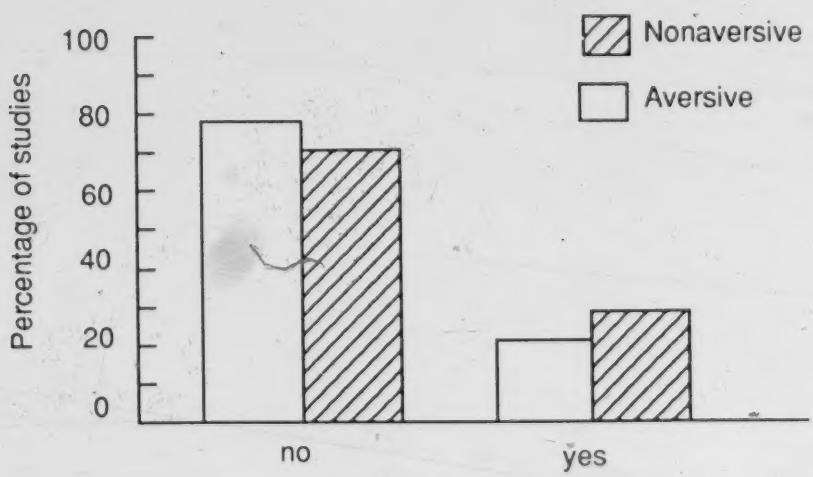

FIGURE 22. Criterion - Evidence of or Programming for Generalization

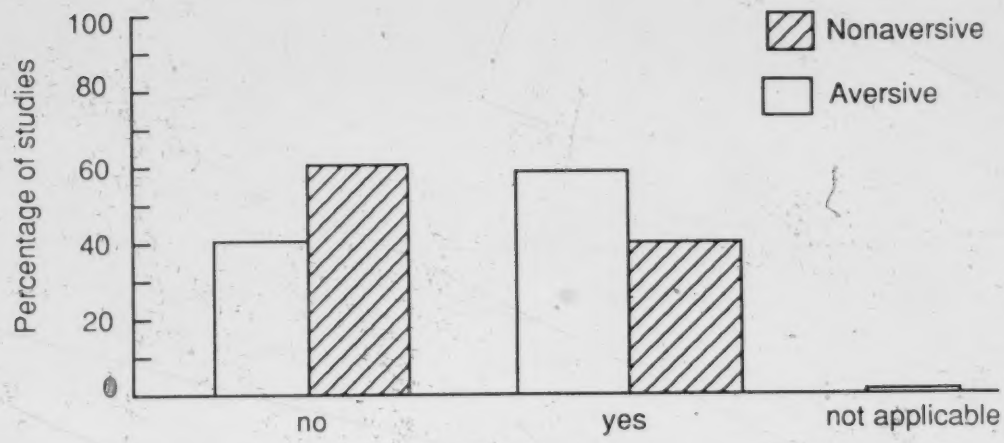

FIGURE 23. Long-term Treatment

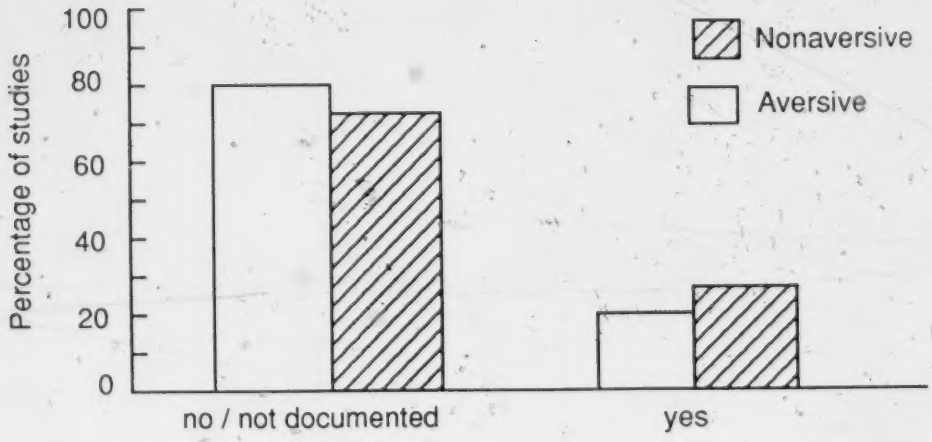

FIGURE 24. Criterion - Follow-up Measurement or Treatment

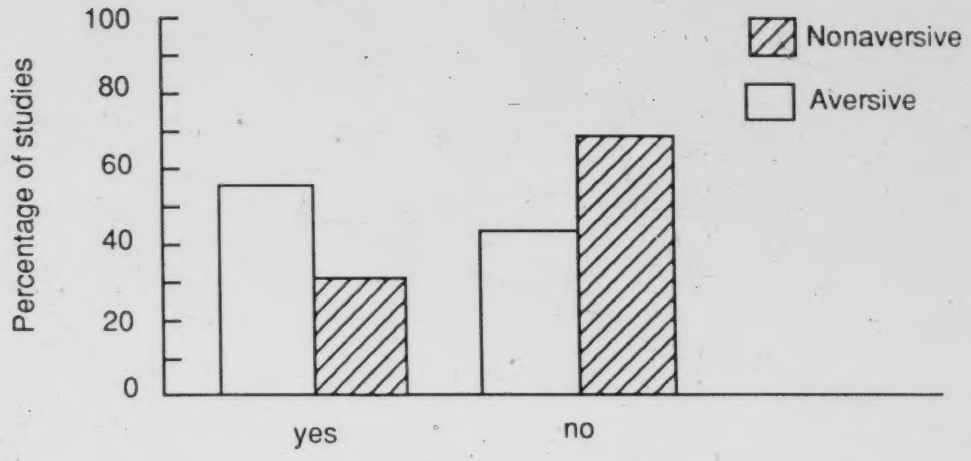

FIGURE 25. Criterion - Positive Procedures Applied Concurrently

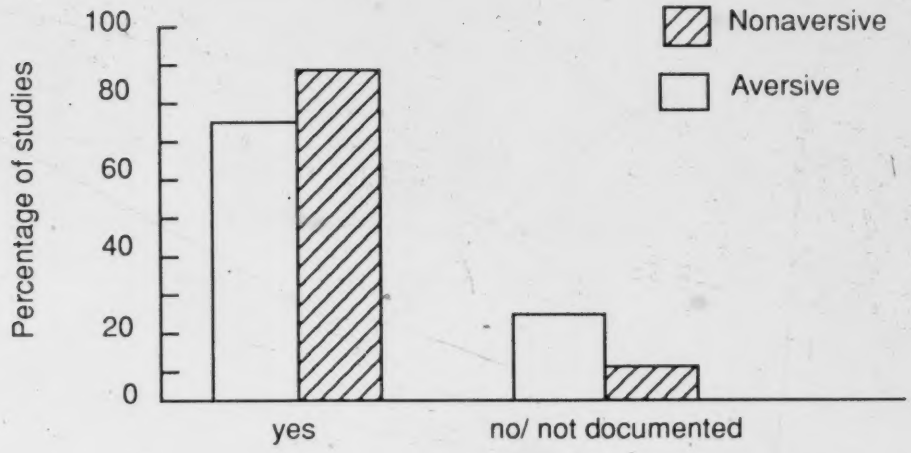

FIGURE 26. Criterion - Functional Alternatives

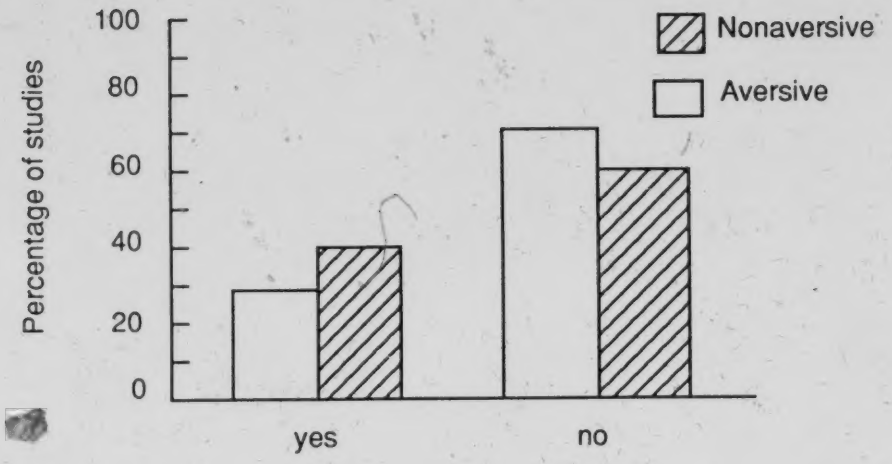

FIGURE 27. Criterion - Communicative Alternatives

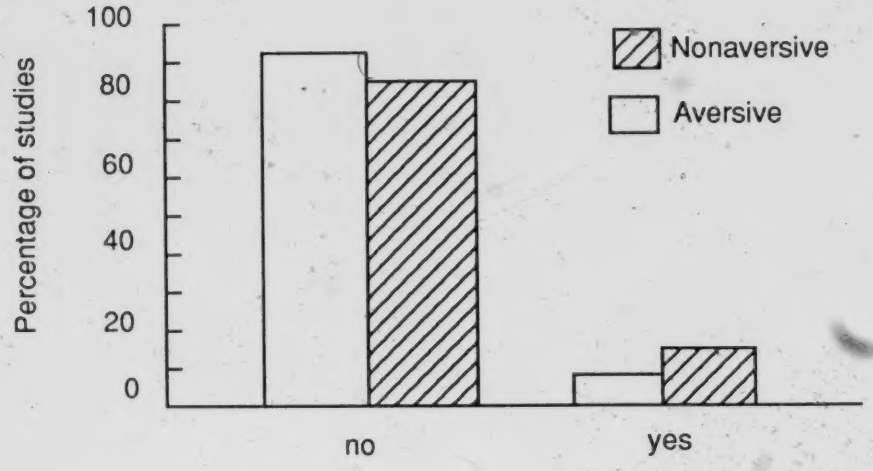

FIGURE 28. Improvements Noted in Desirable Behaviors

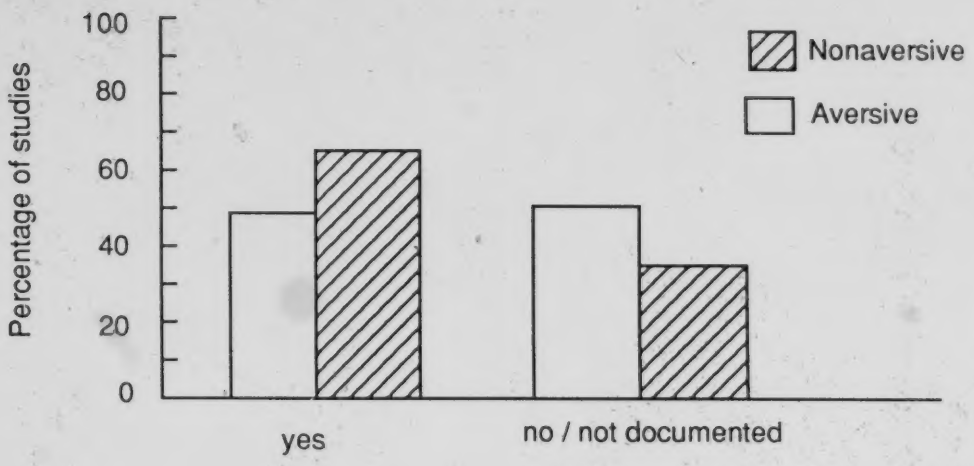

FIGURE 29. Criterion - Qualifications of Supervisors

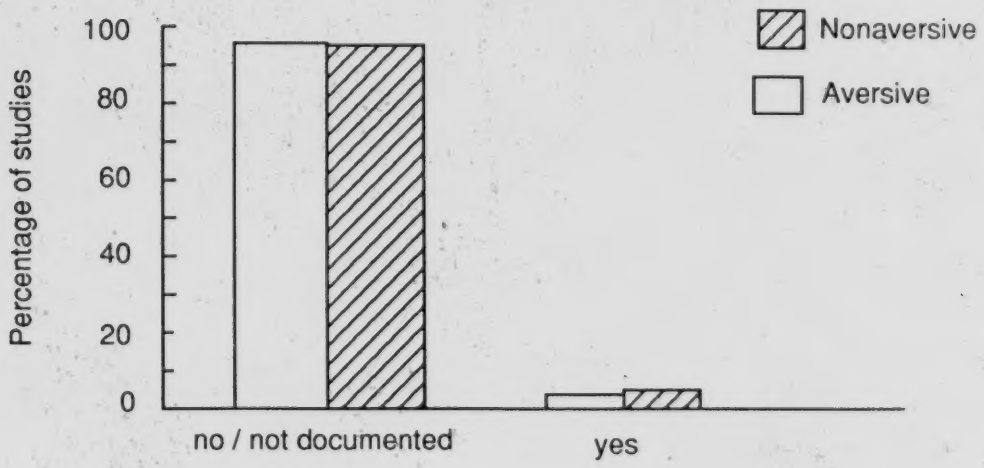

FIGURE 30. Criterion - Treatment Providers Experience Treatment

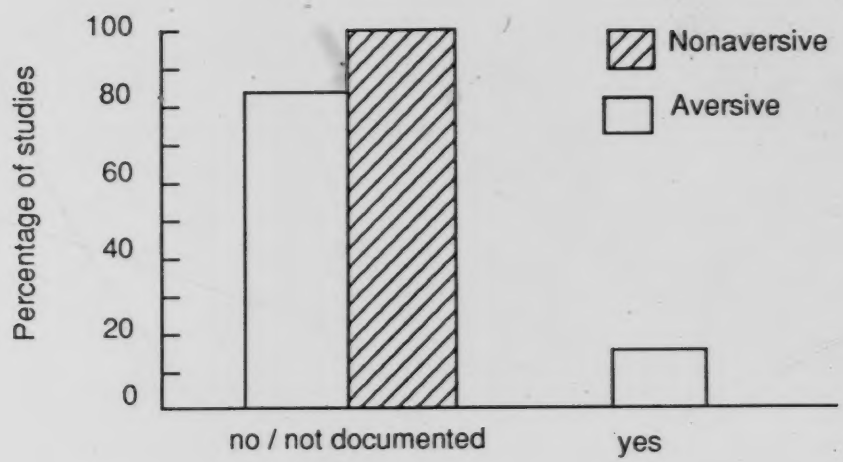

FIGURE 31. Criterion - Competency of Treatment Providers

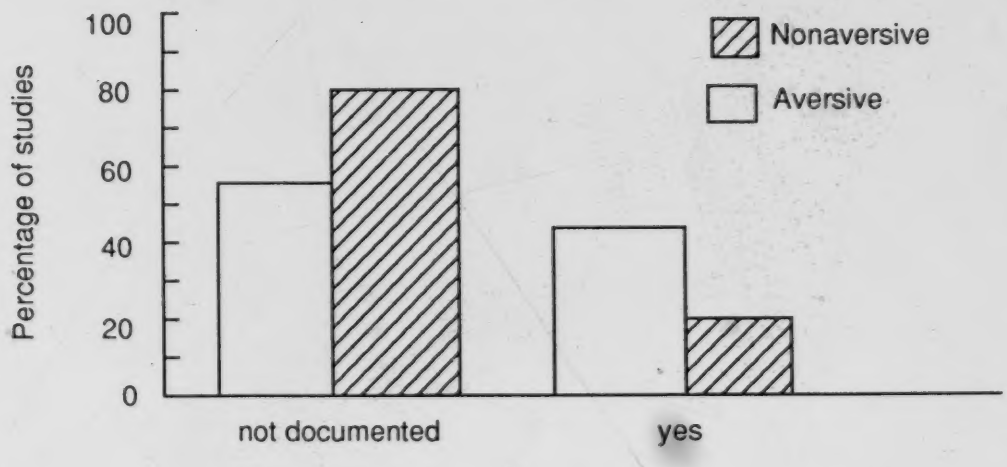

FIGURE 32. Criterion - Concurrent, Positive Program

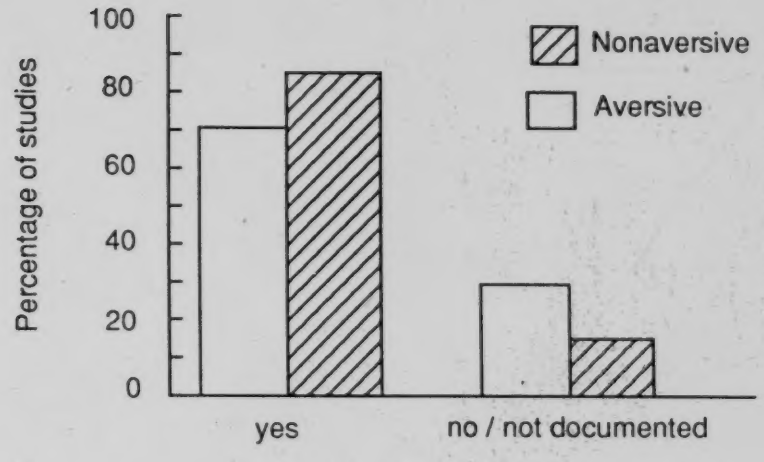

FIGURE 33. Criterion - Due Process Procedures

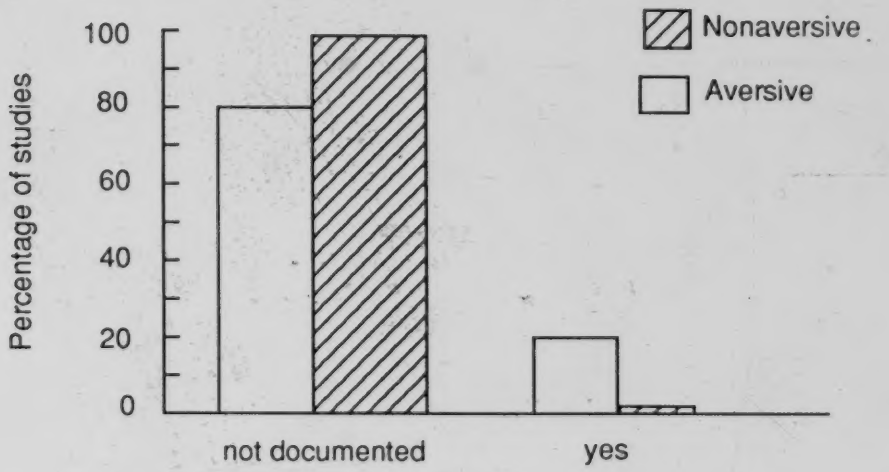

FIGURE 34. Criterion - Documentation of Independent Review

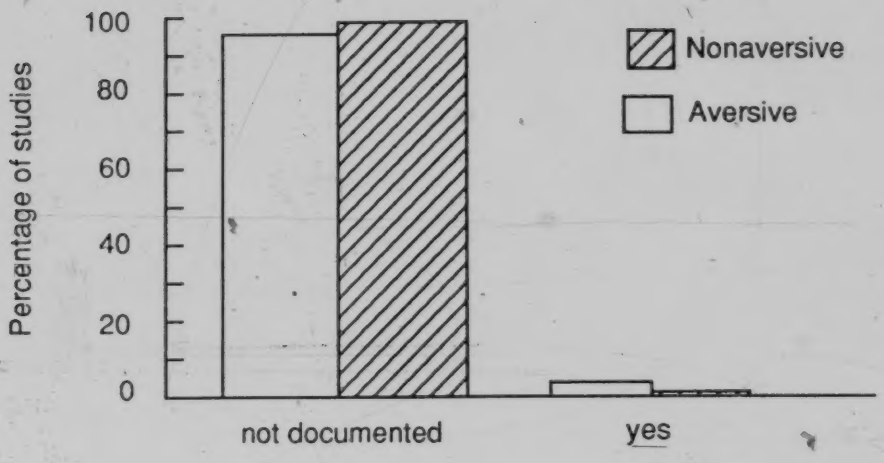

FIGURE 35. Criterion - Documentation of Informed Consent

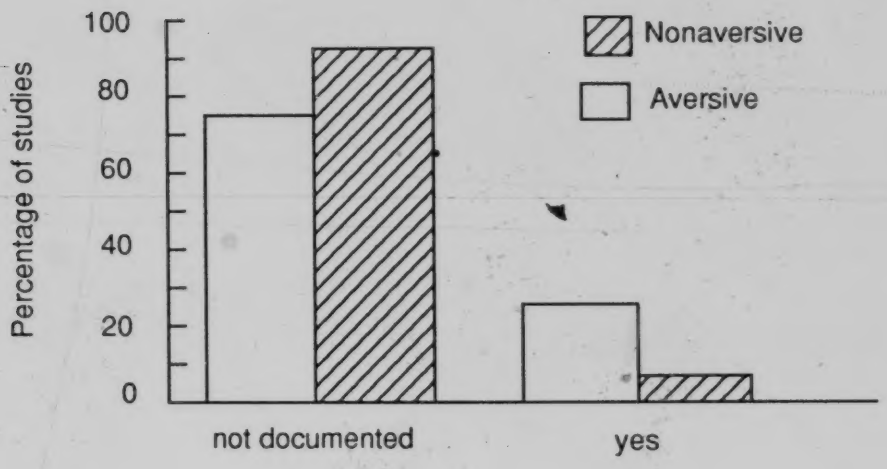

FIGURE 36. Criterion - Evaluation of Capacity to Consent

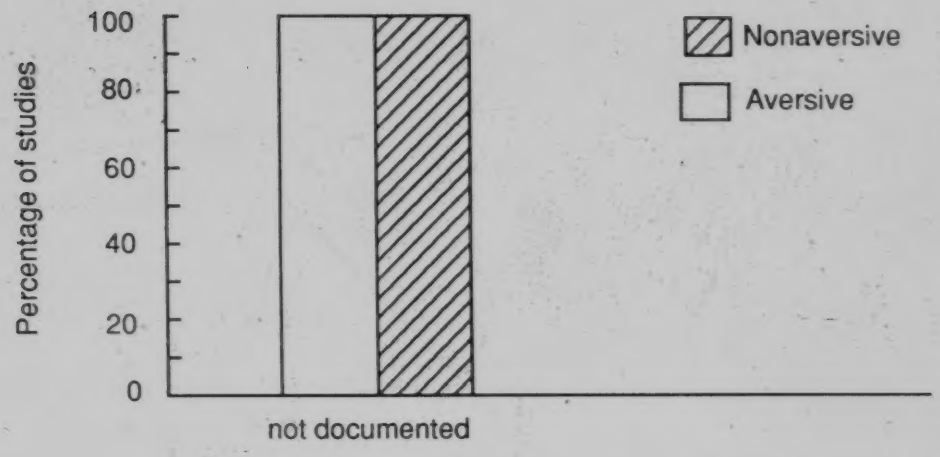

FIGURE 37. Criterion - Social Validation

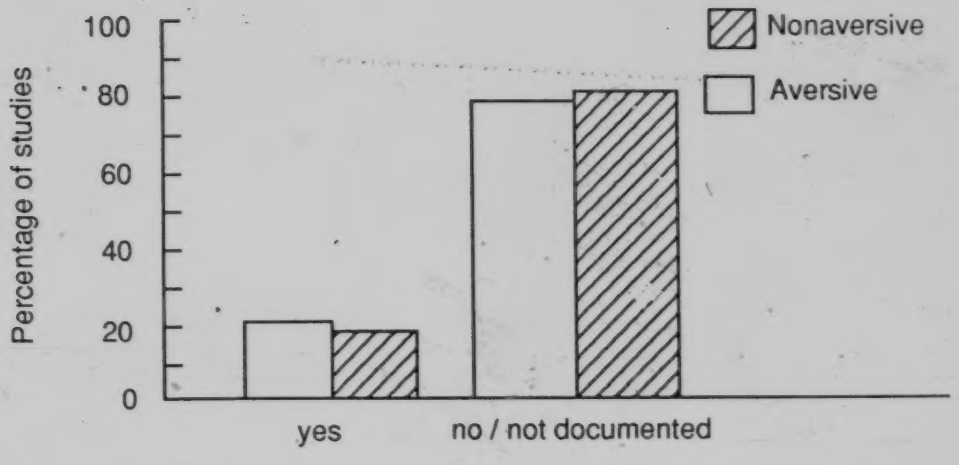

FIGURE 38. Criterion - Empirical Validation

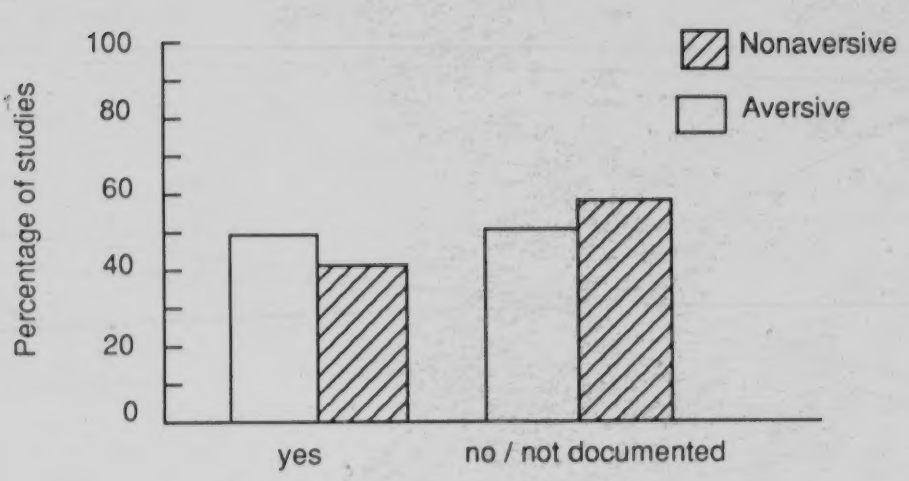

FIGURE 39. Criterion - Proposed Benefit Achieved

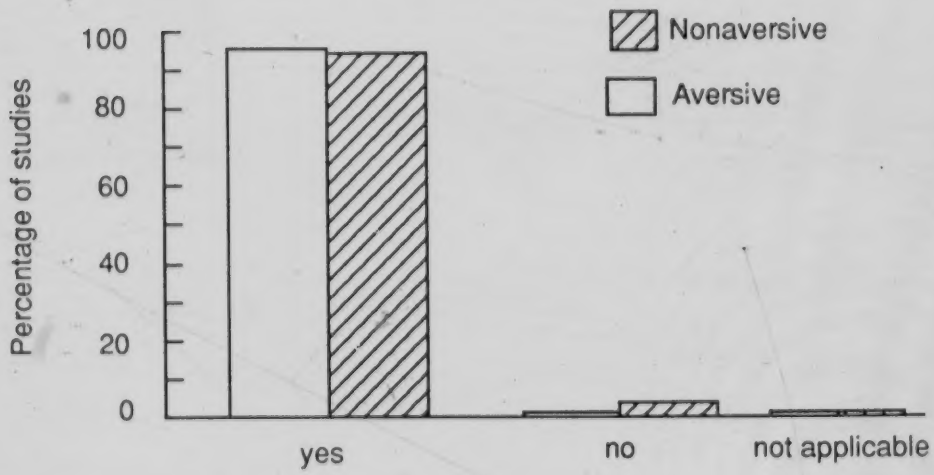

FIGURE 40. Criterion - Concurrent Treatment with Medication

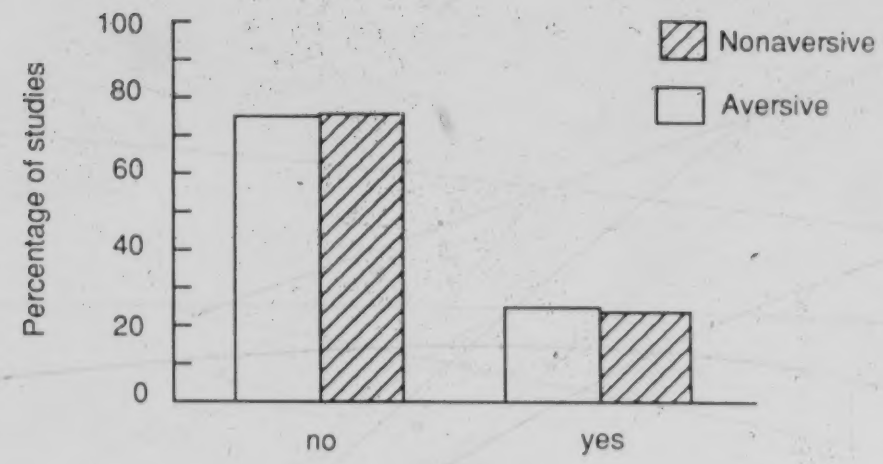

FIGURE 41. Evaluation of Effects of Medication on Behavior

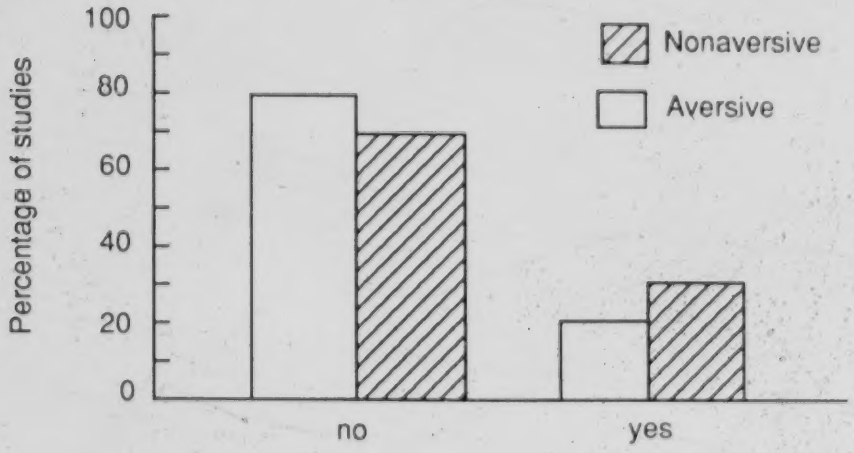

FIGURE 42. Percentage of Subjects in Each Age Group

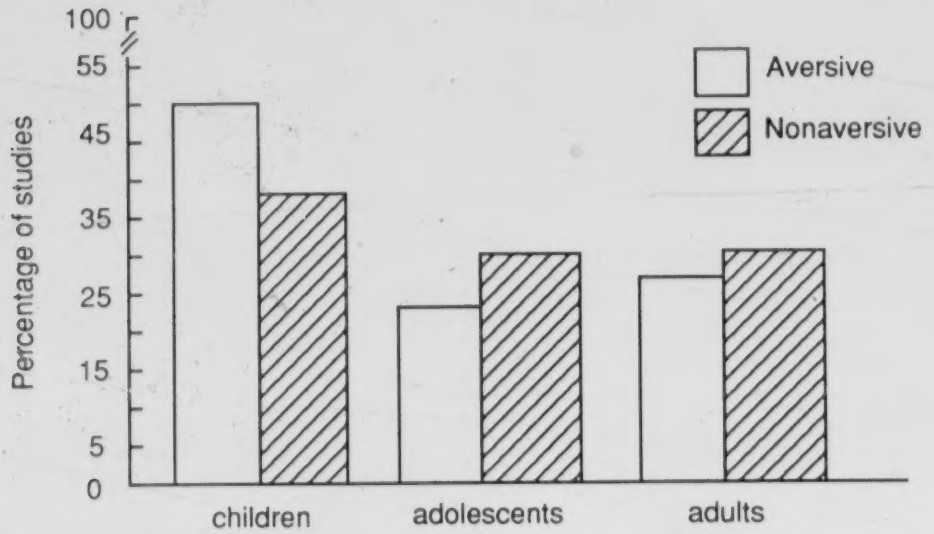

FIGURE 43. Residential Status of Subjects

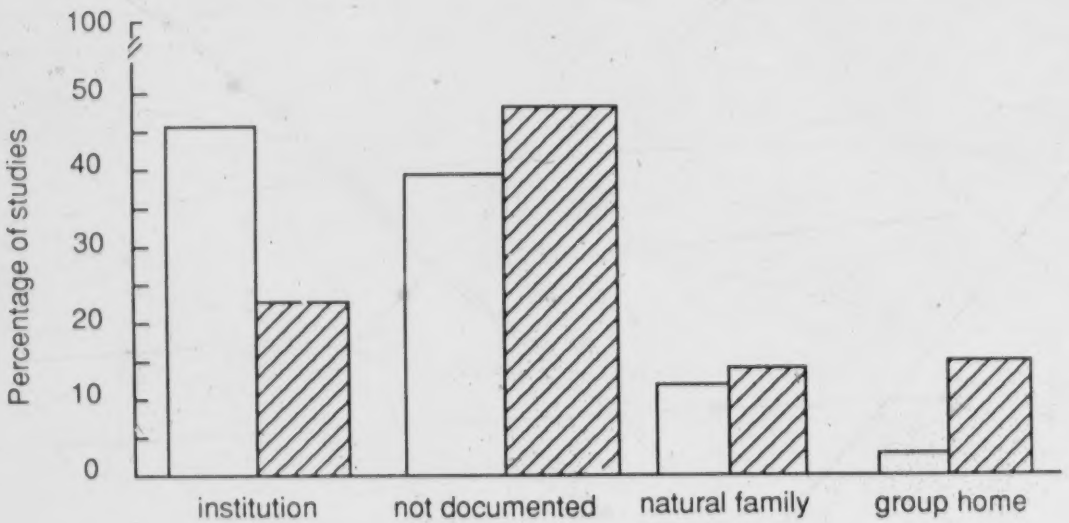

FIGURE 44. Diagnoses

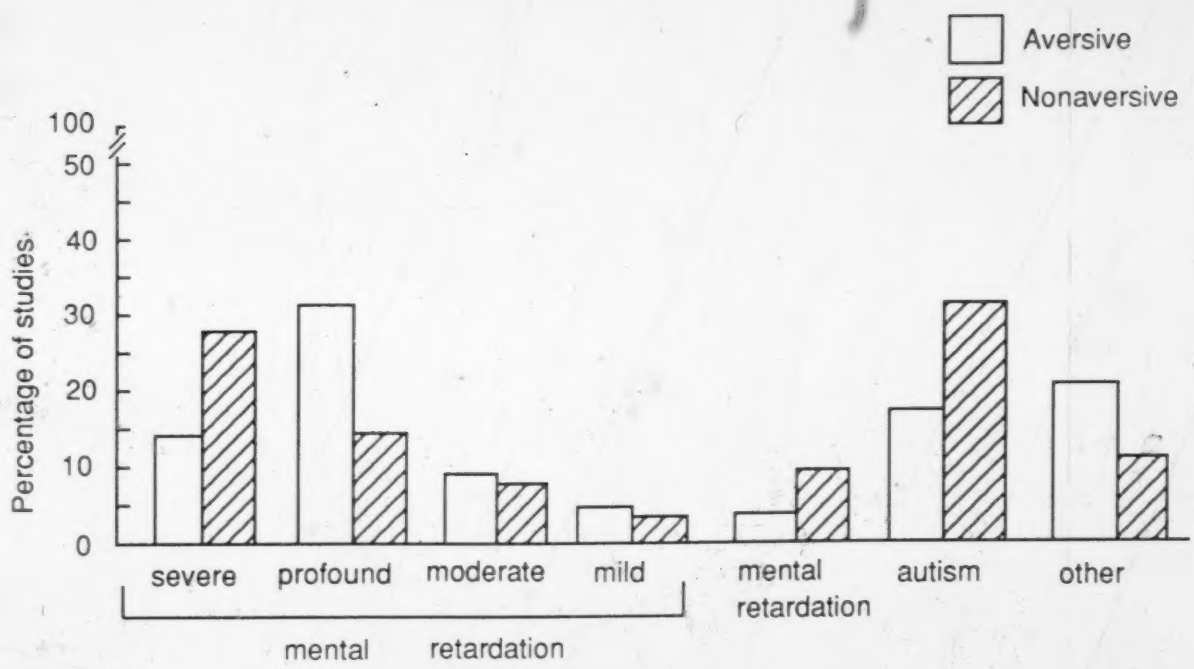

FIGURE 45. Treatment Setting

CHAPTER 6. DISCUSSION

The present evaluation of aversive and nonaversive interventions was conducted in response to the current controversy regarding appropriate treatment for severely maladaptive behavior. Criteria for the appropriate use of intrusive treatments were identified on the basis of a literature review. These criteria were then operationalized, and a broad sample of five years of the published research on decelerative treatments was compared to these guidelines. Studies were also analyzed with respect to the types and severity of behaviors treated, as well as the treatments used and their level of intrusiveness. Demographic data were analyzed as well, and an assessment of the effectiveness of the respective procedures was carried out.

Ratings for the Operationalized Criteria

The findings reveal that the aversive and nonaversive studies in this sample were relatively equally deficient in terms of providing information regarding a significant number of criteria for the appropriate use of decelerative procedures. Information regarding capacity to consent, informed consent, and due process procedures, in particular, was not provided in the majority of both types of studies, although nonaversive studies lacked information to a somewhat greater extent for the latter two criteria.

The results from ratings on the operationalized criteria, also suggest that some of the research in this sample has serious methodological problems, in terms of the failure to consider the influences of regression and phase sequence effects. The fact that a significant percentage of studies lacked an initial stable baseline, indicates that regression in particular may be a significant influence on behavior change in these treatments. In addition, the research in this sample also lacked information in terms of long-term behavior change. These findings are consistent with previous evaluations of aversive treatments (e.g., Guess et al., 1987; Lundervold & Bourland, 1988; Starin & Fuqua, 1987), in which a significant proportion of the studies reviewed lacked information regarding generalization, maintenance, or long-term treatment. These methodological or design shortcomings make it difficult to assess the literature in terms of the extent of change produced by behavioral interventions.

The results of this research support the notion that aversive therapies have undesirable side effects on the recipient of treatment. Aversives were shown to produce a greater percentage of negative side effects than nonaversive treatments. While these side effects were documented, it is interesting to note that only a minority of the aversive studies in this sample also contained information regarding risk of harm, and only a slightly higher percentage of studies included documentation that safety procedures were in effect during treatment. These are relatively serious omissions, given that side effects might include actual physical harm. In one study, for example, during treatment with aromatic ammonia, a subject sustained first-degree burns under the nose.

According to the authors, this was caused by "incidental contact with the capsule during treatment implementation on the evening shift" (Dixon, Helsel, Rojahn, Cipollone, & Lubetsky, 1989, p. 102). In the absence of adequate consideration of possible risk and the implementation of preventative measures, as well as perhaps a failure to consider the proficiency of all treatment providers (only slightly more than half the aversive studies reviewed, contained documentation of assessment of the competency of treatment providers), it is difficult in general terms to justify the use of painful or potentially harmful stimuli such as aromatic ammonia.

It should be noted, however, that the majority of nonaversive studies also failed to document risk of harm and safety procedures. Negative side effects were also reported to occur in a minority of these studies. In other words, the results indicate that nonaversive procedures also involve some degree of risk of harm, and in certain situations have negative side effects as well.

Demographic Information

The results of the demographic analysis revealed that a greater percentage of subjects in the present sample were children, and a greater proportion of clients were also labelled as more severely disabled. These findings are similar to the results of previous reviews (e.g., Guess et al., 1987; Matson & Taras, 1989), and may be due to the fact that clients with problem behaviors treated at a young age, do not become adolescents or adults with behavior problems

(Matson & Taras, 1989). This is a somewhat more reasonable explanation than the assertion by Guess and colleagues (1987), that children as a group are "powerless," and are therefore more vulnerable to control or manipulation.

The results of the analysis of settings in which studies were conducted, are also consistent with previous findings (i.e., Guess et al., 1987). Aversive procedures were applied more often in segregated, institutional settings, while nonaversive treatments were used to a greater extent in segregated special education classes. This finding may support the assertion by Meyer and Evans (1989), that the use of aversives encourages segregation. However, both types of treatments in this sample were applied more often in segregated settings, and the settings in this sample simply differed in terms of degree of segregation. The findings regarding treatment setting may reflect a greater involvement in research and publication by researchers associated with clinics, institutions, or special education classrooms, rather than a specific trend toward treating clients with aversives in isolated settings. Alternately, a greater percentage of clients in institutions may exhibit the most severe behavior problems, which have traditionally been treated using intrusive therapies.

Severity of Behavior and Intrusiveness of Procedure

A greater percentage of the nonaversive studies in this sample dealt with behaviors of lesser severity. This may reflect the fact that the "myth of intrusiveness" influences the likelihood of publication to some extent. It may

also influence choice of treatment. That is, less intrusive procedures may be seen to be less effective with behaviors which are more severe, and are therefore used less frequently to treat these types of behaviors. It is interesting to note that both types of treatments were relatively ineffective in dealing with more severe behaviors, as gauged by the percentage of change measure. This finding may reflect a publication bias, in which unsuccessful treatments are more likely to be published when they deal with more severe behaviors, as compared to unsuccessful treatment for less problematic behavior.

The fact that a greater number of more intrusive procedures were used with behaviors of lesser severity in this sample (contrary to the least intrusion doctrine), also supports Daniels' notion (1986), that the "spread effect" may influence therapists who use these procedures to some extent. For example, a number of multi-experiment papers in the present sample (e.g., Rolider & Van Houten, 1985; Singh, Watson, & Winton, 1986), successively applied a single procedure to a variety of behaviors exhibited by a number of other clients. That is, these applications were not necessarily appropriate or individualized treatments, given the level of intrusiveness of the procedures versus the severity of the behaviors involved in each particular application.

Behaviors and Treatments

Self-injury, stereotypy, and aggression were the behaviors most frequently treated in both aversive and nonaversive studies. These results are similar to

those of earlier reviews (e.g., Lennox et al., 1988; Matson & Taras, 1989). Given that these are some of the most "noticeable," socially stigmatizing, and problematic behaviors exhibited by clients with developmental disabilities, it is not surprising that the bulk of the literature has dealt with these problems. In terms of procedures, overcorrection and time out were the most frequently used aversive techniques, followed by visual and facial screening. These results are consistent with the results obtained by Lennox et al. (1988), Matson & Taras (1989), and Guess et al. (1987). It is interesting to note that these three techniques are somewhat lower on the "intrusiveness" continuum. Studies using less intrusive aversive procedures may be more likely to be published, due to current public and professional opposition to the use of aversives.

Effectiveness Ratings

The findings regarding effectiveness (i.e., the median values for between-phase change) suggest that both types of procedures in this sample, were roughly equivalent in terms of the degree to which they effected a change in behavior. These results suggest that nonaversive treatments may be viable alternatives to the use of punishment, at least for behaviors of low to moderate severity. For more severe behaviors, however, studies using both types of therapies received effectiveness ratings which were lower than the effectiveness values for behaviors of lesser severity on the continuum. In other

words, neither aversive nor nonaversive treatments were very effective in reducing more severe problem behaviors in this sample.

Reliability of the Instrument

Reliability was assessed using a test-re-test procedure for between-phase effectiveness computations, for the ratings on the operationalized criteria, and for demographic information. Reliability values were at acceptable levels for all data, although the reliability rating for one of the criteria ("purpose of study") was not at an acceptable level. This latter criterion is therefore not considered to be reliable. The results from the test-retest procedure indicate that this study has internal validity. However, because inter-rater reliability assessments were not done, the external validity of this study has not been assessed.

Limitations of the Study

The findings of the present study pertain to what has been published in the research literature, and may not reflect actual clinical practice. For example, the studies reviewed lacked documentation of due process and informed consent, but this is likely a reflection of editorial policies and positions taken by particular professional associations associated with these journals. That is, the studies reviewed may not present this type of information, but given the greater legal constraints and public and professional scrutiny of all types of behavioral

interventions, it is likely that informed consent was obtained, or some sort of due process procedure was carried out, at least for more recently published research. In addition, the results show that in this sample, a fewer number of studies using aversives were published over time. This may indicate that the use of punishment has declined over time, or it may reflect an increasing reluctance on the part of editorial boards to publish studies using aversives.

Alternately, the results of this evaluation may reflect the characteristics of the sample itself. The sample consists of a greater number of studies published in 1985 and 1986, and the results are therefore weighted in terms of the characteristics of these earlier studies. Given that the controversy regarding the use of aversives and the consideration of related issues was in an early stage of development during that period, studies published at this time may not have been seen to require the types of documentation currently considered important.

Finally, the obtained effectiveness values provide some data regarding amount of change between phases in studies, but these values are relatively gross measures which have been averaged over phases and studies. Therefore, this information provides some indication of the effectiveness of particular treatments, but the results are not definitive. Some form of meta-analysis of this research might provide more veridical data regarding treatment effectiveness.

Implications for Practice and Future Research

The results of this study indicate that there is a disparity between what is documented in the research literature, and what are considered best practices in terms of the treatment of severe problem behavior. The present study does not address the question of whether this finding reflects a disparity between actual clinical practice and established guidelines. It is true, however, that the published research influences clinical practice to some extent. It is hoped that actual implementation of these treatments is influenced to a greater degree by established guidelines, and that future research is more comprehensive in terms of the documentation that it contains.

It is difficult to draw definitive conclusions regarding the lesser or greater effectiveness or acceptability of aversive and nonaversive treatments, on the basis of the results of this study. The demonstrated methodological shortcomings of the studies, however, suggest that there is a need for sound research in a number of areas. In particular, research on treatments for more severe problem behaviors, such as aggression or self-injury, is required in order to assess efficacy. Research of this type must also be methodologically sound, and should incorporate programming for long-term change (i.e., maintenance and generalization) to a greater extent.

In addition, behavior change data generated from decelerative research should be supplemented with information regarding the social and empirical

validity of treatments and outcomes, with the overall goals of integration and community participation as guiding principles. Greater consideration of the social validity of treatments in particular, might lead to a decrease in the use of highly artificial and intrusive procedures. Finally, researchers and practitioners must also document the consideration of clients' civil and human rights, in any situation in which those rights are somehow compromised or influenced.

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APPENDIX 1

Data Sheet

TITLE_____

_____

_____

AUTHOR(S)_____

_____

YEAR _____ JOURNAL

_____

VOL._____ NO. _____PAGES _____

CLIENT(s): No. _____ AGE _____SEX: MALE ____ FEMALE ____

DIAGNOSIS: PMR ____SMR _____ MR_____ AUTISTIC _____

OTHER _____

RESIDENTIAL STATUS: INSTITUTION

_____SETTING(S)_____

GROUP HOME _____

NATURAL FAMILY _____

OTHER _____

TREATMENT _____

1. Right to Treatment

A. Least restrictive means-

a) What type of behavior was involved?

i) Self-injury? _____

ii) Self-stimulation? _____

iii) Physical aggression towards others? _____

iv) Verbal aggression/ abusiveness? _____

v) Property destruction? _____

vi) Noncompliance? _____

vii) Eating or mouthing inedible/noxious objects (pica/ coprophagia)? _____

viii) Masturbation? _____

ix) Other? Specify. _____

b) What was the severity of the behavior?

i) Was it life-threatening? _____

ii) Had tissue damage occurred? _____

iii) Was it of a socially stigmatizing/ socially unacceptable nature? _____

c) Who would potentially benefit from the procedure?

i) client _____

ii) others _____

d) Would the behavior interfere with acquisition of appropriate behavior?

i) No. _____

ii) Yes. _____

e) Was any kind of ecological validation carried out?

i) No. _____

ii) Yes. _____

iii) No information. _____

f) Were measures of "excessiveness" such as social validation carried out prior to the study?

i) No. _____

ii) Yes. _____

iii) No information. _____

g) Were non-aversive means tried first?

i) Yes. If so, what were the techniques used? _____

ii) No. _____

iii) No information. _____

h) Had other procedures been tried before?

i) No. _____

ii) If yes, describe._____

iii) No information. _____

i) What effect did these previous application(s) have on the behavior?

i) No effect. _____

ii) Increased its frequency of occurrence. _____

iii) Decreased its frequency of occurrence. _____

iv) No information. _____

j) Was the adequacy of these applications assessed?

i) If yes, describe assessment procedure._____

_____

ii) No. _____

k) What was the purpose of the study?

_____

_____

l) Was there any documented risk of harm from the procedure?

i) No. _____

ii) Yes. _____

(a) Physical harm? _____

(b) Emotional harm? _____

iii) No information. _____

m) Were safety procedures/ precautions in effect?

i) No. _____

ii) Yes. Specify. _____

iii) No information. _____

B. **Effectiveness of procedure**

a) What type of design was used?

i) Case study? _____

ii) Group experimental? _____

iii) Single subject design? _____

(a) If so, was the behavior at a stable baseline rate/level prior to commencement of treatment?

(i) No. _____

(ii) Yes. _____

(iii) No information. _____

(b) Were phase-sequence effects controlled for?

(i) No. _____

(ii) Yes. Specify how._____

(iii) No information. _____

(c) Was regression in the data controlled for?

(i) No. _____

(ii) Yes. Specify how. _____

(iii) No information. _____

b) What effect did the treatment have on the inappropriate behavior?

i) Reduced it. _____

ii) Eliminated it. _____

iii) Increased it. _____

iv) Uncertain. _____

v) Increased appropriate (no data on problem behavior). _____

c) In the authors' opinion, was the suppression clinically significant?

i) No. _____

ii) Yes. _____

iii) No information. _____

d) Did the behavior return to baseline/preintervention level at any point in the treatment?

i) Yes. _____

ii) No. _____

iii) No information. _____

e) Is there documentation of any side effects?

i) No. _____

ii) Yes. _____

(a) Positive? Specify._____

(b) Negative? Specify._____

iii) No information. _____

f) Were interobserver reliability checks carried out?

i) No. _____

ii) Yes. _____ Specify the reliability coefficient. _____

iii) No information. _____

g) Was a maintenance phase instituted?

i) No. _____

ii) Yes. Specify the procedure._____

iii) No information. _____

h) Did the study include programming for generalization?

i) No. _____

ii) Yes. Specify the procedure._____

iii) No information. _____

i) Were long-term treatment conditions in effect?

i) No. _____

ii) Yes. Specify the procedure._____

iii) No information. _____

j) Were positive procedures concurrently applied?

i) No. _____

ii) Yes. Specify the procedure._____

iii) No information. _____

k) Were functional alternatives made available to the subject?

i) No. _____

ii) Yes. Specify the alternative(s)._____

iii) No information. _____

l) Was an alternative behavior reinforced?

i) No. _____

ii) Yes. Specify behavior._____

m) Were communicative interventions applied?

i) No. _____

ii) Yes. Specify the procedure._____

iii) No information. _____

n) Were improvements noted in desirable behaviors?

i) No. _____

ii) Yes. Specify the improvement._____

iii) No information. _____

C. Qualifications of treatment providers-

a) What were the qualifications of the treatment supervisor?

i) Ph. D. (Behavior Analysis) _____

ii) Ph. D. (Other specialization- specify) _____

iii) Master's degree _____

iv) Other _____

v) No information. _____

b) Was this person familiar with and experienced in treating severely maladaptive behavior?

i) Yes. _____

ii) No. _____

iii) No information. _____

c) What other persons carried out the procedure?

i) Facility staff _____

ii) Parents _____

iii) Siblings _____

iv) Peers _____

v) Others. Specify. _____

d) Did treatment providers actually experience the treatment themselves?

i) Yes. _____

ii) No. _____

iii) No information. _____

e) Were the competencies of others involved in the program assessed prior to commencement of treatment?

i) Yes. _____

(a) Specify the assessment procedures and competency criteria.

_____

_____

_____

ii) No. _____

iii) No information. _____

D. Quality of treatment-

a) Was a concurrent positive program or functional skill training program conducted?

i) Yes. _____

(a) Specify the program._____

ii) No. _____

iii) No information. _____

2. Rights of consent and procedural due process-

a) Was any form of due process procedure carried out?

i) Yes. _____

(a) Specify the procedure._____

ii) No. _____

iii) No information. _____

b) Was any kind of independent review conducted prior to initiation of treatment?

i) Yes. _____

(a) Specify the procedure and intervals at which it was conducted.

_____

_____ _____

ii) No. _____

iii) No information. _____

c) What types of committees were involved and what persons made up these groups?

i) Human rights committee _____

ii) Peer review panel _____

iii) Other. Specify. _____

d) Did committee members view the application of the procedure?

i) Yes. _____

ii) No. _____

iii) No information. _____

e) Did they experience it themselves?

i) Yes. _____

ii) No. _____

iii) No information. _____

f) Was informed consent obtained?

i) Yes. _____

(a) From client _____

(b) From legal guardians. _____

(c) From others. Specify. _____

ii) No. _____

iii) No information. _____

g) Was capacity to consent evaluated?

i) Yes _____

ii) No. _____

iii) No information. _____

3. Social and Empirical Validation -

a) Were social validation measures carried out?

i) Yes. _____

(a) Who provided the information? Specify. _____

(b) When were these done?

(i) Before treatment implementation. _____

(ii) During treatment. _____

(iii) After treatment. _____

ii) No. _____

iii) No information. _____

b) Did the effects of the procedure affect the client's life situation?

i) Yes. _____

(a) Prevented transition to a more restrictive environment. _____

(b) Facilitated transition to a less restrictive environment. _____

(c) Allowed the client to experience a wider range of educational activities. ____

(d) Allowed the client to experience a wider range of community activities. __

(e) Other.

Specify._____

ii) No. _____

iii) No information. _____

c) Did the proposed benefit occur?

i) Yes. _____

ii) No. _____

iii) No information. _____

4. Medication Effects

a) Is there documentation of concurrent treatment with psychotropic medication?

i) Yes. _____

(a) Specify medication and/or type of medication. _____

_____

ii) No. _____

iii) No information. _____

b) Was any evaluation of pharmacological effects on the target behavior carried out?

i) Yes. _____

ii) No. _____

iii) No information. _____